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THE MEDICAL CURRICULUM OF THE UNIVERSITY OF SYDNEY.[1]

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AND

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THE object of a medical curriculum is the training of medical men, most of whom will ultimately be engaged in the practice of medicine and surgery. Since medicine is not merely a craft, but an art having its roots in scientific and humanistic soil, the medical curriculum should be framed with a view to securing not only an adequate professional training, but an academic and cultural background capable of providing the means of growth and development. The academic atmosphere, the scientific spirit, should pervade the whole curriculum and, indeed, their cultivation is the main justification for there being any connexion between a university and a medical school. In the past it has been customary to divide the curriculum into three parts, dealing in turn with the fundamental sciences, the so-called ancillary sciences, and the practice of medicine and surgery. At the present day, however, when academic medicine is coming into its own, it is no longer justifiable to draw a distinction between medicine and the ancillary sciences. Moreover, the division of the curriculum into three parts is confusing, in that it fails to indicate the differentia of medical science as contrasted with the fundamental sciences in their various general and special branches. The simplest and most logical method is to divide the curriculum into two parts, the first dealing with the fundamental biological and physical sciences, the second being concerned with medical science, that is to say, with that branch of biology which deals with the study of disease in all its manifestations and relations.

[1] This paper is published with the concurrence of the Dean of the Faculty of Medicine.

First Half of Curriculum.

In the University of Sydney each half of the curriculum occupies approximately three years. In the first half of the curriculum the biological and physical sciences are first treated of generally; later, certain aspects of biology, namely, normal morphology, physiology and genetics are studied intensively, more especially with reference to the human subject. Thus physical science (physics and chemistry) and general biology (botany and zoology) occupy the first year, while anatomy, physiology and embryology are studied in the second and third years. A short course on normal psychology, conducted by the professor of psychiatry, is given at the end of the course on physiology, in continuation of the study of the function of the nervous system. As to whether psychology should be regarded as a branch of physiology might depend upon one's metaphysical conceptions, but there would seem to be every justification for studying the functions of the mind along with the other functions of the living organism, and in this way psychology, linked with physiology, comes to take its place among the biological sciences.

Included in the physiology course there is also a short series of lectures on drugs used as physiological reagents. The main courses of pharmacology, systematic and applied, are, however, placed in the fourth year, in order to bring this subject into relationship with therapeutics.

Second Half of Curriculum.

As regards the second half of the curriculum, an attempt has been made to introduce the various subjects of medical science in a rational sequence and to correlate them with one another in such a manner as to give a due sense of their essential unity and interrelationships. The principle underlying this arrangement is the division of this part of the curriculum into three stages, according to the method of approach to the study of disease, each stage occupying approximately one year.

In the first period disease is considered mainly from the point of view of disordered physiology and morphology: how altered function and structure manifest themselves in symptoms and signs, and how both function and structure may be modified by remedial measures. This forms a natural transition from anatomy and physiology to the study of disease. It is hoped that this transition may be made more gradual in the future by the institution during the third year of regular special introductory demonstrations in clinical subjects which illustrate the application of physiology and anatomy. It would seem advisable to make a further effort to introduce the students to clinical work as early as possible in the third year.

In the second period specific diseases, their ætiology, characters, course, specific treatment and prevention form the main objects of study, while instruction is given in various special diagnostic and therapeutic techniques.

The third period is given over almost entirely to hospital work in general medicine and surgery, and is in the main devoted to differential diagnosis, prognosis and a synthesis of all previous points of view.

First Period.

Applying these principles in detail, the subjects occupying the first period comprise:

Lent, Trinity and Michaelmas terms, fourth year.	Pathology and bacteriology. Medicine and surgery, first course. Pharmacology, *materia medica* and therapeutics. Clinical medicine and clinical surgery. Obstetrics (Michaelmas term only).
Long vacation term between fourth and fifth year.	Gynæcology. Introductory lecture-demonstrations. Psychiatry. Introductory lecture-demonstrations. Pædiatrics. Medicine and surgery (continuation of first course).

A complete programme of instruction is drawn up in all subjects and the courses are arranged and correlated in such a way that all possible overlapping is eliminated and the various parts form a more or less homogeneous whole. For example, while the bacteriologist deals with infection, the pathologist takes up inflammation and repair, the surgeon wounds and sepsis, the physician fever and pain, the pharmacologist antiseptics and analgesics, and so on. It is intended that from time to time combined demonstrations illustrating these various aspects of the subjects dealt with will be given. In these "set piece" demonstrations, pathologist, bacteriologist, physician and surgeon will all combine to illustrate all aspects of chosen diseases.

The general basis of the programme is a functional or systemic one, beginning with the defences of the organism and passing to the systematic study of disorders of the various functions and systems of the body. From the outset the conception of the organism as an integrated whole is kept in view. Beginning with the simplest integrations and passing to the more complex, the study of function culminates in the consideration of the highest integration of all, that of the personality. For this reason psychiatry follows upon and is continuous with the study of disorders of nervous integration and is introduced in the long vacation term between the fourth and fifth years. The function of reproduction is dealt with first in the course of lectures in obstetrics, which is placed at the end of the fourth year, and later in a course of lectures introducing the subject of gynæcology which follows in the long vacation term between the fourth and fifth year.

Medicine and surgery are run as a joint course consisting of a series of lecture-demonstrations in medicine and surgery, given at the hospital, where they may be suitably illustrated by cases from the wards as well as with the aid of epidiascopic projections and pathological specimens. In order to facilitate the provision of illustrative material for these lectures, the student supervisors at each hos-

pital collaborate with the various lecturers in securing cases suitable for demonstration. A special register of such cases is kept and funds are provided for assisting patients who may have to come from a distance. The usual procedure is to demonstrate the cases first and then to build up theory around them, elucidating the various problems presented by the patients with the aid of pathological anatomy, pathological physiology and the other sciences. Owing to the general character of the subject matter there is, as a rule, little difficulty in securing adequate clinical material through the organization set up for the purpose. This method, which works backwards from effect to cause, combines the features of the clinical and the systematic lecture.

In the medicine course the functional aspect of disease is more particularly emphasized, while in the course in pathology the morphological aspects of disease processes are more fully studied. The course in pathology is framed to anticipate the teaching of medicine and surgery, and consists of lecture-demonstrations in general and systematic pathology and practical pathology. At the same time a full course in bacteriology, consisting of approximately fifty lectures and forty hours' practical work, is given at the university. In surgery, general principles are emphasized and special attention is given to traumatism, infection, inflammation and early malignant disease. Lectures on anæsthetics are introduced as a part of the course on applied pharmacology. They are given by the special lecturer on anæsthetics, and serve as an introduction to the practical course in the fifth year.

In conformity with the general plan, a certain number of lecture-demonstrations on various minor regional specialties—dermatology, ophthalmology, oto-rhinology—are introduced at the appropriate time into the general courses of medicine and surgery. Thus the specialist in diseases of the ear, nose and throat deals with the upper respiratory passages when the respiratory system is under consideration; the ophthalmologist discusses vision at the same time as the nervous system is being studied, and the dermatologist gives a lecture upon the general pathology of the skin (types of rashes *et cetera*) as an introduction to the study of cutaneous affections in general.

Closely related to the study of the modification of function resulting from disease is that of the modification of function brought about by remedial agents. This aspect of the subject is dealt with in a course of lectures and demonstrations on general therapeutics and applied pharmacology, the course being intimately related and complementary to the lectures on medicine and correlated as far as practicable with the instruction given in systematic pharmacology. *Materia medica* and practical *materia medica* form part of the course in therapeutics. As far as possible a very close correlation between the subjects dealt with in all these courses is maintained throughout the fourth year. The accompanying table (page 799) from the details of the lectures of the year illustrate how this correlation is carried out. This has been easily possible to achieve, but, of course, calls for complete harmony amongst the teachers of various subjects.

Hospital work during this period is confined to the afternoons which are left completely free for this purpose. The clinical work is of necessity of an introductory nature and is under the charge of tutors in medicine and surgery, to each of whom is allotted a group of students averaging eight in number. The medical tutors, who are assistant physicians at the hospital, introduce the students in this year to the study of clinical medicine and give practical instruction in general semeiology and therapeutics. The work in the wards consists in the application at the bedside of the principles inculcated in the systematic lectures and demonstrations. The object of the course is to make the student thoroughly familiar with the signs and symptoms of disease and the methods of examining patients, so as to enable him to determine the nature and location of altered function and structure. Observation of the general appearance of diseased individuals is first undertaken, to be followed by the study of the methods employed in the physical examination of patients. These methods are first applied to the study of the normal individual so as to establish a standard of comparison. The investigation of the various functions and regions of the body in disease is then carried out *pari passu* with the consideration of these in the lectures. At an early period the student is introduced to the routine method of taking case histories.

The medical tutors also exercise a general superintendence over the work of the clinical clerks in the medical wards, and in this they are assisted by assistant clinical tutors, whose main function is to assist the clerks with case-taking and to correct case records. They likewise give instruction in ward laboratory work, which is taught as a part of and in association with the general examination of patients.

These tutors and their assistants not only give instruction in methods of examination and case-taking, but undertake the instruction of students in observing the effects of treatment and applying at the bedside the principles presented in the course of lectures on general therapeutics and *materia medica*.

The work of the surgical tutors during the same period is on similar lines and in the same manner covers introductory surgery. Particular emphasis is laid upon case-taking, methods of examination, common surgical diseases (particularly those due to trauma, infection and malignant disease), the principles of asepsis, and simpler surgical therapeutic methods. During this period the students also attend the casualty rooms of the various hospitals for set periods. Instruction is so arranged that there exists a close correlation with the systematic lectures and demonstrations. The classes are made as practical as possible and are held in the wards and out-patient departments of the various teaching hospitals.

During the long vacation term a series of introductory lecture-demonstrations is given in the mornings by the special lecturers in gynæcology, pædiatrics and psychiatry. During the same period, but so arranged as to antedate the two latter courses, there is a short correlated course on the medical, surgical and therapeutic aspects of neurology and endocrinology.

Second Period.

The second period occupies the fifth year, which is devoted in the main to the study of specific diseases, their ætiology, characteristics, course and treatment. In addition, clinical practice and theoretical instruction in special subjects, semeiological and therapeutic, is undertaken. The main course consists of a series of joint medical and surgical lecture-demonstrations on nosography and special therapeutics, given at the Royal Prince Alfred Hospital. These lectures are given by the professors of medicine and surgery, by university lecturers on recognized specialties, or by members of the honorary staffs of the teaching hospitals. As in the case of the fourth year, a programme of lectures and demonstrations is drawn up, so that specific diseases may be reviewed in a logical sequence and from different points of view, but a greater amount of elasticity in the programme is permitted, in order that clinical material may be utilized for demonstration purposes when it becomes available. For example, in the case of syphilis, the primary and cutaneous, secondary and tertiary manifestations are dealt with by the lecturer in dermatology, syphilis of bones and joints is covered by the professor of surgery, congenital syphilis by the pædiatrician, and visceral syphilis by one of the honorary physicians, general paralysis, however, being lectured on by the professor of psychiatry. Finally, the treatment of syphilis, especially the primary, secondary, cutaneous and tertiary manifestations, is undertaken by the dermatologist. Similarly, in the case of tuberculosis, the manifestations of tuberculosis in childhood (bones, glands *et cetera*) are dealt with by the lecturer in pædiatrics, while adolescent (genito-urinary) tuberculosis is dealt with by a urological specialist at the Royal Prince Alfred Hospital, adult tuberculosis (pulmonary tuberculosis, tuberculosis of the larynx, alimentary tract, suprarenal *et cetera*) by one of the honorary physicians in collaboration with the tuberculosis clinic at the Royal Prince Alfred Hospital, and, finally, tuberculosis of the skin is lectured on by the lecturer in dermatology.

It may be noted that with the exception of gynæcology and psychiatry, the lecturers on special subjects do not give their lectures in the form of isolated courses. For example, the lecturer on dermatology deals with specific infections of the skin, such as the epiphytic infections and scabies, but he also takes part in the joint series of lectures on syphilis and on diseases due to allergy (eczema, urticaria *et cetera*).

While the general course on specific diseases is given at the Royal Prince Alfred Hospital a parallel course of instruction in infectious disease is simultaneously held at the infectious diseases hospital on Saturday mornings during the Lent and Trinity terms.

Other courses of instruction, such as those on preventive medicine and medical jurisprudence, are given in the mornings of this year, but the times are so arranged that there is never more than one lecture a morning, so that all the students are free by 10 o'clock at the latest for their hospital work.

The clinical instruction in special subjects takes up the remainder of this period and the time-table is so arranged that small groups of students (eight to twelve in each group) attend the clinics on each of the special subjects on one or two days a week for a complete term. It has been possible to arrange this so that no overlapping of subjects occurs and an unbroken continuity of instruction in each subject is obtained. These special subjects are: pædiatrics, clinical gynæcology, obstetrics, dermatology, oto-rhinology, ophthalmology, psychiatry and radiotherapy. In the main, students receive all their introductory lectures in these subjects as a part of general medicine and surgery before they attend for their special clinical instruction.

Clinical pædiatrics is taken at the Royal Alexandra Hospital for Children, the students attending daily in comparatively small groups for a complete term and entering into all the activities of the hospital, as well as attending special courses which are arranged by the honorary staff under the direction of the lecturers on this subject.

The training in clinical obstetrics is carried out at the two women's hospitals and consists of three weeks' tutorial instruction, residence in the hospital for a period of four weeks, and three weeks' attendance on pre-maternity and post-maternity cases in the out-patient and the septic wards of the hospitals. During the latter period special classes in operative obstetrics are also given by special tutors. Later in the sixth year a fourteen days' refresher course with residence in the hospital is also given.

Clinical gynæcology is taken at the general hospitals and the students attend three days a week for a full term. The tuition in clinical ophthalmology, dermatology and oto-rhinology takes place mainly in the out-patient's department, and comprises attendance at the clinic with instruction by the honorary staff, directed by the university lecturer on the subject, one day a week for a term. It has been realized that this work should comprise mainly the methods of approach to these cases, methods of case-taking, methods of examination; in other words, training in a special technique without attempting to teach the students a great deal of detail about the various special diseases. Rather are the instructors urged to deal with each specialty in its relationship with general medicine and surgery.

At the end of each period of clinical instruction in pædiatrics, oto-rhinology, ophthalmology and

dermatology, a clinical examination is held, on the results of which a certificate of attendance and proficiency in the particular subject is given.

Clinical psychiatry consists of tuition in the outpatient department of the teaching hospital (psychiatric clinic) on one afternoon a week and visits to a mental hospital on Saturday mornings.

Most of these special clinics are held in the afternoon, so that during the morning half of the students (that is, those not away at the Royal Alexandra Hospital for Children and the Women's Hospital) are free for hospital ward work and professorial clinics in medicine and surgery.

In conformity with the general scheme a feature of the training in clinical medicine and surgery at this period is the following of the course of disease and the memorization of case data. The student also makes the cases he studies the starting point of his reading and in this way the foundations of clinical experience are laid.

With the exception of a short course on the history of medicine, given during the long vacation term between the fifth and sixth years, lectures on preventive medicine and on medical jurisprudence and ethics complete the systematic lectures of the curriculum. Preventive medicine naturally comes after the consideration of infectious diseases, diseases of children and mental diseases, while medical jurisprudence can be usefully dealt with only after the student is already acquainted with most branches of the art and science of medicine and surgery, hence its position at the end of the fifth year.

Third Period.

The sixth year is almost entirely devoted to clinical work. It is a time for apprenticeship and practice in the art and for a synthesis of all previous points of view with regard to disease. The student having become acquainted with the various ways in which the structure and functions of the body may be altered, with the characters and course of the various specific diseases which may attack the organism, and with the various methods of examination and treatment, is now in a position to know what to look for and what to expect. Consequently he can usefully concentrate upon what is described as the "peculiar art of the physician"—differential diagnosis and prognosis. No systematic lectures are given, but the student attends clinical lectures by senior honorary medical officers, the topics chosen being, in the main, such as most readily lend themselves to discussion from the point of

Section of the Time Table showing the Correlation of Subjects Taught in the Fourth Year.

Date.	Pathology and Bacteriology. 11-1.	Medicine and Surgery. 10-11.	Pharmacology.[1]	Therapeutics.[2]	Materia Medica.[3]
March, 1932.					
Friday, 18th	Introductory pathology	Causes of disease (M)			Pharmacopœias. Prescribing.
Monday, 21st	Introductory pathology	Introductory lecture on surgery (S)	Absorption, excretion, dosage		
Tuesday, 22nd	Immunity (bacteriology)			Antiseptics	
Wednesday, 23rd	Inflammation	Trauma (S)			
Easter.					
Wednesday, 30th	Pathology of infection	Clinical aspects of inflammations (S)			
Thursday, 31st	Immunity			Antiseptics	
April, 1932.					
Friday, 1st	Pathology of infections	Infection of wounds (S)			Prescribing, choice of preparations.
Monday, 4th	Pathology of infections	Abscess, cellulitis (S)	Morphine		
Tuesday, 5th	Immunity			Protective astringents	
Wednesday, 6th	Pathology of infections	Infections of the hand (S)			
Thursday, 7th	Immunity			Astringents	
Friday, 8th	Pathology and bacteriology carry on with inflammation, infection, immunity and general pathological processes	Physiological aspects of disease (M)			Prescribing of substances involving strength
Monday, 11th	Ditto	Pain (M)	Opium series		
Tuesday, 12th	Ditto			Local anæsthetics	
Wednesday, 13th	Ditto	Pain (M)			
Thursday, 14th	Ditto			Counter-irritants	
Friday, 15th	Degenerations *et cetera*	Pain (M)			Prescribing of substances involving dosage.
Monday, 18th	Degenerations *et cetera*	Fever (M)	Salicylates and colchicum		
Tuesday, 19th	Bacteriology of infection			Analgesics and antipyretics	

[1] Mondays, 9 a.m. [2] Tuesdays and Thursdays. [3] Fridays.

view of differential diagnosis and prognosis. As regards the ward clinics, the student works largely as a freelance and is given more responsible duties as an integral part of the hospital organization, especially as regards case-taking, ward laboratory work and minor therapeutic and diagnostic procedures. His case records are now rather more discursive, containing less irrelevant detail than in the earlier years, and they are made to include a commentary. At the bedside clinics cases are discussed in all their bearings, and the student is taught not merely to examine patients thoroughly and expeditiously, but to follow up the clues as they arise, so as to arrive with reasonable rapidity at a conclusion. Groups of students also act as clerks in the medical and surgical out-patient departments, where they gain experience in the rapid investigation of cases which have not been previously worked up or seen by senior physicians and residents. They also have an opportunity of spending short periods in some of the special out-patient clinics—tuberculosis, allergy, diabetic clinics—while on Saturday mornings they attend the tuberculosis dispensaries in the city and the Waterfall Sanatorium. Students are detailed for *post mortem* work, especially upon cases they have investigated and followed during life, and they are required to write commentaries correlating the *ante mortem* with the *post mortem* data. The results of any *post mortem* examinations have to be reported regularly by the clerks to the clinics, at which they are required to demonstrate the specimens and to give a reasonable account of the pathological processes. From time to time "clinico-pathological conferences" are arranged. At these the histories of patients are read by the clerks and the diagnosis is discussed by the students, and finally the specimens are demonstrated by the pathologist. In this way the student gains some appreciation of the possibilities of error in diagnosis and of the importance of correlating physical signs and symptoms with the changes in the organs responsible for them. Finally, a sense of perspective with regard to the development of medical science is given by the insertion of a short course of lectures on the history of medicine during the long vacation term of this year.

The only other courses held during the sixth year are a short course on operative surgery, held in the mornings, and a refresher course in obstetrics, which comprises a further fortnight's internship in an obstetrical hospital.

THE SPECIFICITY OF URINARY PROTEOSE.

By ROBERT S. STEEL, M.B., Ch.M. (Sydney), M.R.C.P. (London),

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A PRECIPITATE of a complex nitrogenous substance has been isolated from the urine of allergic patients by Oriel and Barber. This substance is termed urinary proteose, and, according to these authors, its importance lies in the fact that it is a definite substance which, in some acute and chronic diseases, appears to contain the specific antigen upon which the symptoms depend and which can therefore be employed for specific desensitization in measured doses. It is the antigenic moiety that is of importance, and the antigenic substance is obtained when the urine is collected during an attack. The original authors claim that the urinary proteose contains the specific antigen and suggest that the antigenic moiety may be a secondary antigen resulting from the action of primary antigens on the liver and other tissues.

Dosage in Treatment.

Warning has been given by Oriel and Barber that patients are extremely sensitive to minute doses of proteose isolated from their own urine. This liability of patients to react in a general manner to very small doses of proteose has been used to prove that the proteose is specific and, therefore, must contain the antigenic substance.

A dilution of one in 1,000,000 to one in 10,000,000 has been used for purposes of injection in the treatment of allergic patients. Barber points out that generalized reactions have frequently been produced by injections of a fraction of a cubic centimetre of a dilution of one in 1,000,000, and the usual time for a generalized reaction to occur is on the third day after the injection.

Freeman injected one-twentieth of a cubic centimetre of undiluted proteose, supposedly specific, but this produced no local or general reaction.

Months before Freeman published this statement I had the following experience.

An asthmatic patient (number 196) was referred to me by a colleague for skin testing. As there was no skin sensitivity manifested in this patient, he was sent back to his doctor with the advice to use urinary proteose. This was prepared by the Biochemical Department, which has prepared all the proteoses used at the Allergy Clinic at the Royal Prince Alfred Hospital, and was administered by my colleague at weekly intervals. When the patient was sent back to report to me, I found to my astonishment that the following dosage had been given at weekly intervals, with proteose solution (1 in 100): 0·2 cubic centimetre, 0·4 cubic centimetre, 0·6 cubic centimetre, 0·8 cubic centimetre, 1·0 cubic centimetre, 1·0 cubic centimetre. At no time was there any evidence of any local or general reaction.

Before this experience we used 0·01 cubic centimetre of one in 100 proteose intradermally without any harmful effect as an initial dose, and increased each dose by 0·01 cubic centimetre. Later, the initial dose was increased to 0·05 or 0·1 cubic centimetre, and during treatment the amount was increased by 0·1 cubic centimetre at intervals of a week.

Excretion of Proteose.

Oriel and Barber found only a small quantity of urinary proteose excreted in average normal health, whereas they found a large quantity excreted in allergic individuals when symptoms were present.

Burgess noted that the average amount excreted by normal controls and allergic patients was the same.

Specificity of Urinary Proteose.

To prove the specificity of urinary proteose the original authors performed experiments to correspond to the Prausnitz-Küstner reaction and obtained positive results. Further, Barber writes:

> Surely a substance which is capable of constantly producing acute exacerbations of a given patient's symptoms in a dose of, say, 0·1 cubic centimetre of a 1 in 1,000,000 dilution may be considered specific.

Oriel states that Conybeare, using proteose from a patient suffering from hay-fever-asthma, tried intradermal tests with this on: (i) pollen sensitive subjects, (ii) asthmatics, not pollen sensitive, (iii) normal controls, and that, in approximately 100 cases, 80% of the pollen sensitive patients gave positive skin reactions and none of the normal controls reacted.

Oriel writes:

> Proteose from one case sensitive to inhaled antigens was capable of giving positive intradermal tests with the majority of allergic patients with similar sensitizations, but not with another group sensitive to a different type of antigen.

This information would appear to confirm the specificity of the proteose isolated from the urine. But Freeman found that the proteose in his hay fever patients was non-specific. Murray Lyon, Percival and Stewart found that four out of twenty-five proteoses failed to give any positive reaction whatsoever and fourteen gave positive reactions in all cases in which tests were made. They found normal controls giving a positive skin reaction, but there was no exaggeration of response obtained by the Prausnitz-Küstner technique.

Skin Reactions to Proteose.

Barber states that sensitivity may be dermal or epidermal, but apparently the majority of tests are performed by the intradermal method. For the skin testing Murray Lyon, Percival and Stewart use a dilution of one in 10,000. A positive reaction is shown by an area of erythema appearing a few minutes after injection of the proteose. This lasts for half an hour or so and is followed after some hours by a secondary area of erythema. This was found to persist for about twelve hours. Burgess uses 0·1 cubic centimetre of a one in 1,000 dilution for skin testing.

At the Allergy Clinic of the Royal Prince Alfred Hospital proteose was isolated from the urine of twenty-seven patients. In the case of patients suffering from asthma and urticaria the urine was collected either during an attack or as soon as possible following an attack. Catheter specimens of urine were obtained from all adult female patients, but not from men and children. Proteose solution, that is, one in 100, was used for skin testing in quantities from 0·01 to 0·1 cubic centimetre. Reference to Table I shows that only eleven patients gave a positive skin reaction to the proteose isolated from their urine, when injected intradermally.

Of thirteen asthmatic patients selected for treatment with proteose, eleven gave positive skin reactions to inhalants and had daily severe attacks of asthma. Five of these gave a positive reaction to their own proteose. This low figure may be due to the fact that the urine was not actually collected during an attack in each instance. But even in some cases where the urine was collected during an attack, no skin response was obtained. Another possibility to account for the low figure is faulty technique in the preparation. But here again the proteose was prepared in every instance by the one person, according to the technique described by Oriel and Barber, so it is difficult to believe that this is a cause of the low figure obtained. It was frequently found that a positive skin reaction was produced when the proteose was injected into another patient, although it produced no reaction on the skin of the patient from whom it was obtained.

TABLE I.

Patients from whom Proteose was Isolated and the Skin Response.

Diagnosis.	Number of Patients.	Positive Skin Reactions.
Asthma	13	5
Urticaria	5	3
Dermatitis herpetiformis	3	1
Eczema	2	0
Allergic dermatitis	2	1
Toxic erythema	1	1
Prurigo	1	0
Total	27	11

Positive skin reactions are represented as follows:

\+ for an area of erythema 0·5 to 1·0 centimetre.
\++ for an area of erythema 1·0 to 2·0 centimetres.
\+++ for an area of erythema 2·0 to 3·0 centimetres.
\++++ for an area of erythema over 3·0 centimetres in diameter.

Only those patients who showed the delayed reaction were regarded as being "positive" to that proteose when injected intradermally.

An attempt was made to evaluate the skin tests further. Proteose from the urine of four patients was selected. Each patient was tested by intradermal injection of proteose from that particular urine and with the proteose isolated from the urine of the other three patients.

Patient number 1 is a severe asthmatic and gave a strongly marked reaction to his own proteose and gave a positive reaction to the proteose from number 3. Patient number 2 is suffering from *dermatitis herpetiformis* and gave no response to her own or any of the other three. Number 3 is a patient suffering from asthma and was in *status asthmaticus* when the urine was collected. He gave no response to his own proteose, either during his distressed condition or in the quiescent period afterwards. But he gave a positive reaction to proteose from numbers 1 and 4. Patient number 4 is suffering from urticaria and gave a positive skin reaction to all tests. These results are tabulated in Table II.

Patch tests were performed with one in 100 proteose from the particular individual,

TABLE II.
Intradermal Reactions of the Four Selected Proteoses.

Patient Number.	Sex.	Age.	Diagnosis.	Sensitivity.	Proteose 1.	Proteose 2.	Proteose 3.	Proteose 4.
1	M.	17	Asthma.	House dust.	+++	−	+	−
2	F.	51	*Dermatitis herpetiformis.*	?	−	−	−	−
3	M.	35	Asthma.	?	+++	−	−	+
4	F.	43	Urticaria.	Egg.	+++	+	++	+++

but no response was obtained. The mucous membrane of the nose of number 1 was liberally painted with one in ten proteose without any local or general effect. Nothing in the nature of a general reaction could be attributed to the intradermal injections of these proteoses.

The reaction of normal controls was the next question. Three individuals were tested with proteose from patients 1, 2, 3 and 4. In no instance is there any family history or any symptom of allergy, yet all three controls showed definite skin reactions. It was then decided to abandon the idea of testing any other normals. The extent of the skin response on the normals is represented in Table III.

TABLE III.
Normal Controls Tested with the Four Selected Proteoses.

Normal Control.	Proteose 1.	Proteose 2.	Proteose 3.	Proteose 4.
B.	++++	−	+	−
W.	+	−	+	−
S.	++	++	++	+

In the case of the normal control S it is interesting to note that the resulting erythema persisted for forty-eight hours at least.

The four selected specimens of proteose were injected into a number of patients suffering from asthma. Table IV gives the result of these tests.

Proteose from patients numbers 1, 2 and 3 produced numbers of reactions on the skin of the other patients. Proteose 1 produced a marked reaction on patient number 1 and also in the case of a number of the other patients whose sensitivity was similar to that of patient number 1. Proteoses numbers 2 and 3, collected when symptoms were present, gave no response on the skin of the patients from whom they were collected, yet produced well marked erythema on a number of other patients. The same type of response occurred when allergic individuals, other than asthmatics, were similarly tested. Proteose number 4, from an egg-sensitive patient, produced only one skin reaction when injected into these asthmatic patients. A child suffering from urticaria and known to be egg-sensitive, was tested with proteose number 4, but no response occurred. Patient number 3 and control S showed a skin reaction when tested with proteose number 4, but on the whole this proteose behaves more as one would expect if the proteose was specific. However, reference to Table II shows that patient number 4, besides reacting to her own proteose, reacts to each of the other three proteose tests.

In only three patients could one attribute any untoward effects from the injection of one in 100 proteose solution. In one instance an asthmatic patient developed a severe attack about two days following the preliminary injection. The other two patients suffered from urticaria and developed symptoms within a few hours.

Conclusion.

In conclusion, it is difficult to believe that the contention put forward regarding the specificity of proteose is well grounded. The work at this clinic does not support the statement of the original

TABLE IV.
Patients with Asthma Tested with the Four Selected Proteoses.

Patient Number.	Sex.	Age.	Sensitivity.	Proteose 1.	Proteose 2.	Proteose 3.	Proteose 4.
5	F.	43	Bacterins.	−	++	++	−
6	F.	22	Horse, linseed and dust.	+	−	−	−
7	F.	24	Dust, kapok.	−	−	+++	−
8	M.	37	Dust.	−	−	−	−
9	F.	19	Dust, kapok.	++++	+	+++	−
10	F.	40	Bacterins.	−	−	+++	−
11	F.	39	Dust, kapok.	+++	++	++	−
12	F.	11	Dust.	+++	++	++	−
13	M.	26	Dust.	−	++	−	−
14	F.	26	Dust, plantain.	++	−	−	−
15	M.	56	Kapok.	−	−	−	−
16	F.	18	Rye, dust, feathers.	++	−	+	−
17	M.	66	?	+	−	−	−
18	F.	9	Linseed.	+	−	+	−
19	F.	28	Dust.	−	−	−	−
20	M.	35	Dust, kapok.	+++	−	−	−
21	F.	24	Horse, dust, linseed.	+++	−	+	−
22	F.	2	?	++	++	++	−
23	F.	21	Dog hair.	++++	−	−	−
24	F.	22	Dust, plantain.	++++	−	−	−
25	F.	30	Orris, dust, kapok.	+++	−	−	+
61	M.	24	Dust.	+	+++	−	−

authors concerning the dangers of the injection of strong dilutions of the proteose. If it is specific, one wonders why similar reactions are obtained in normal controls and allergic patients. This may indicate that the substance is of such a high grade of specificity that skin reactions are of little or no value.

Over two hundred skin tests have been performed in addition to the injections used in the course of treatment. This number is not large, but the results are most confusing in the light of the optimistic reports of Oriel and Barber.

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THE EARLY TREATMENT OF CONGENITAL TALIPES.

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THE treatment of congenital club feet or talipes should commence as soon as the condition is noticed, that is, usually on the day of birth.

The following table shows the relative frequency of the various forms of talipes in a series of eighty-two patients who were presented for treatment in private practice during the last few years.

Talipes equino-varus	37 cases
Talipes equinus	14 cases
Talipes varus	13 cases
Talipes calcaneo-valgus ..	9 cases
Talipes calcaneus	8 cases
Talipes calcaneo-varus ..	1 case
Total	82 cases

Talipes Equino-Varus.

The commonest deformity is thus *equino-varus*, and I shall deal first with the treatment of this condition.

There are two problems involved in the treatment of congenital *equino-varus*, namely: (i) to correct the *varus* and (ii) to correct the *equinus*. The *varus* should be dealt with first, and the principle underlying its correction is to put the foot passively into a more normal position and to maintain it there by means of moulded plaster of Paris splints. The splints should be removed every day to allow for corrective passive movements, and should be made every few days to take up the improved position obtained by the passive movements. Wedges of felt may be used to take up the daily improved position.

Passive movements without retentive splints are worse than useless, as the little tears occasioned by the vigorous passive movements cause a condition resembling an inflammatory process and lead to the formation of fibrous tissue on the inner side of the foot. If not kept permanently stretched, this fibrous tissue contracts and produces a greater degree of deformity than if the foot were not treated at all. It usually takes from two to three weeks to correct the *varus* deformity properly when the retentive moulded splints are changed every week. More frequent changes in splints lead to a more rapid correction of the deformity. Plasters which completely encircle the foot and which are left on for weeks will never lead to the complete correction of this deformity. Correction under anæsthesia is also not recommended, since correction with successive splints is simpler and more efficient. It is also very difficult for the surgeon to make the complete plaster of Paris casing stay on the foot when the *tendo Achillis* is not divided, and this should be done as a last resort only at the end of treatment.

Loss of power inevitably follows the complete division of tendons. The shortened muscle belly of the calf muscles, with consequent loss of power, seen in adults who have had *talipes equinus* or *equino-varus* in infancy, is an indication of incorrect surgical methods.

Method of Applying the Plaster of Paris Splints.

The plaster of Paris splint is prepared by running a five centimetre (two inch) plaster of Paris bandage out on to a piece of paper or board to a length of from 15 to 20 centimetres (six to eight inches) according to the size of the leg to be treated; six or seven layers are necessary to make a firm splint. While the plaster is still soft, the splint is applied to the passively corrected foot and to the leg to just below the knee. While the surgeon holds the plaster on to the foot and just below the knee, an assistant moulds the plaster round the leg and foot on the inner side. A quick setting plaster and some skill in applying plaster of Paris are necessary to obtain a good position. The splint is removed before it has completely hardened and is allowed to dry away from the foot. This allows the corrected position to be maintained in the plaster splint. Very little force is necessary to obtain a more nearly normal position in the foot of a young baby. Excessive force leads to a position which causes discomfort. Hasten slowly is a very good adage to follow in this part of the treatment. When completed, the splint should show the impression of the heel and inner

FIGURE I.
Showing splint in position in two different stages of treatment.

side of the foot to the end of the great toe and should also show the moulding of the inner side of the knee (Figure I).

The Correction of the Equinus Deformity.

When the foot has been brought into a slight degree of *valgus* by means of the moulded splints, the treatment of the *equinus* should be commenced. This is accomplished by means of strapping and a buckle. A piece of thin wood is first cut to the shape of the sole of the foot, and this is strapped on to the foot at heel and toes (Figure II).

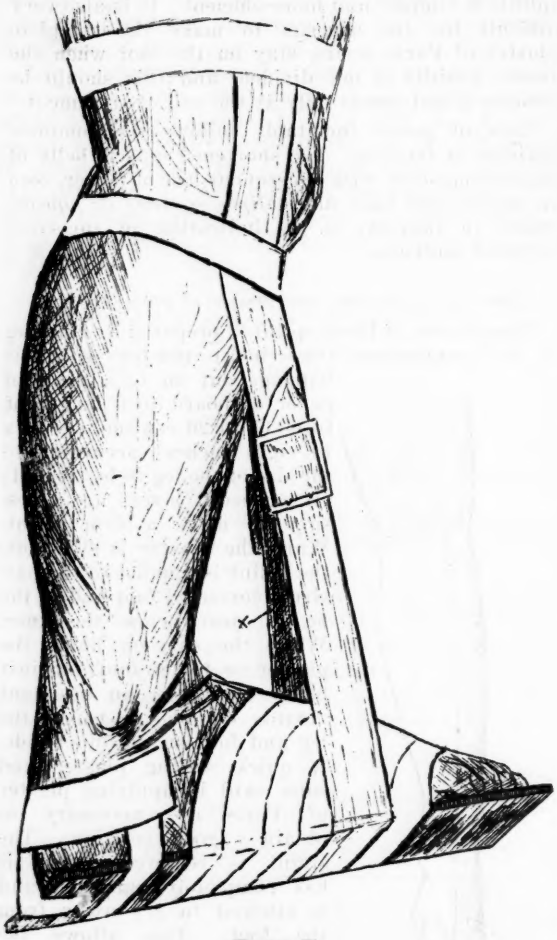

FIGURE II.
Showing method of correcting *equino-varus* deformity.

Adhesive plaster is then applied to the distal surface of this wood and carried round the outer side of the foot to meet another piece of adhesive plaster applied to the outer side of the knee and carrying a buckle (a trouser buckle is suitable for this purpose). The wood applied to the sole enables the foot to be dorsiflexed without adduction of the fore part of the foot, as it does if adhesive plaster alone is used. A second piece of adhesive plaster (Figure II) may be applied to the inner side of the leg and foot to produce complete dorsiflexion of the foot, because a satisfactory strain cannot be put on the *tendo Achillis* and plantar flexing muscles if the foot is allowed to go into excessive abduction. The wood strapped to the sole also prevents the foot from dorsiflexing at the mid-tarsal joint.

The treatment should be pursued until the dorsum of the foot approaches the anterior surface of the leg (Figure III) and until the child is walking for some months. To assist correction in walking, a

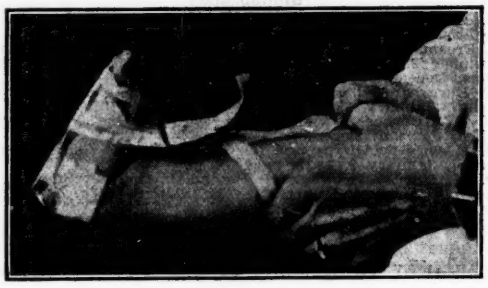

FIGURE III.
Showing end result of treatment by board and strapping.

firmly moulded cuff is applied to the leg at and above the ankle for from 7·5 to 10·0 centimetres (three to four inches), and from this a strap pulls

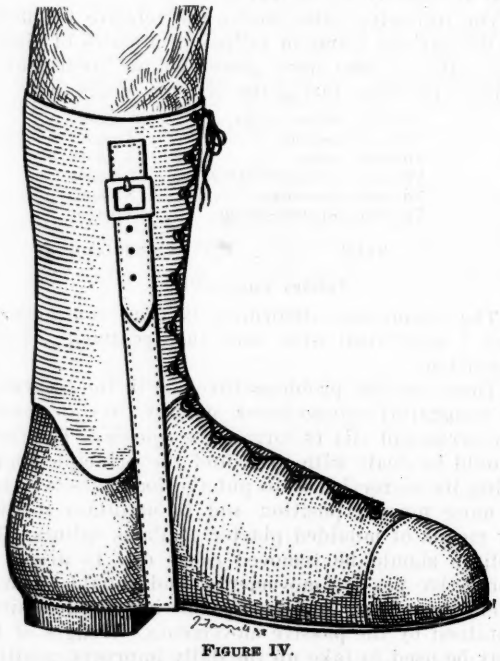

FIGURE IV.
Showing method of treatment during walking.

the outer side of the boot or shoe upwards and outwards (Figure IV). This is continued until the foot shows no deformity in walking.

When a tenotomy of the *tendo Achillis* has to be done in patients whose treatment was not commenced early enough or whose parents have not persisted in treatment, the method used is as follows. Place the child face downwards on the operating table with the foot projecting over the end, then, while one hand presses the foot into dorsiflexion, the other is used for partial division of the tendon in three or four places subcutaneously. This allows the tendon to be stretched without complete division and preserves the tension in the calf muscles when the foot is dorsiflexed. This is one of the conditions in which over-correction of the deformity should be sought. The foot is then enclosed in a circular plaster of Paris bandage and kept in this bandage for five weeks. After this procedure the cuff previously described and a boot should be worn with the heel raised on the outer side and sole, with a patch of leather under the lateral side of the foot and extending from the little toe to the posterior edge of the sole. The raised heel should never be carried as far forward as the sole, as this deprives the foot of movements necessary for its development. In certain severe cases the patient should wear a double iron, extending from just below the knee to the heel of the boot, but that is seldom required if the treatment outlined here is carried out.

The Treatment of Other Deformities.

Congenital *talipes equinus* is treated in early stages by strapping with a foot-piece of wood and buckles, while *talipes varus* is treated much in the way outlined for *equino-varus*. *Talipes calcaneo-valgus, talipes calcaneus* are treated by moulded plaster of Paris splints applied to the dorsum of the foot and anterior surface of the leg and persevered with until an over-correction of the deformity is obtained. While the patient is walking, a raised heel is useful if dorsiflexion is still abnormal in range and plantar flexion less than 45°.

ON MENINGISMUS.

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THE recent publication of the two volumes of the "Selected Writings of John Hughlings Jackson", edited by Dr. James Taylor, has been of great benefit to the whole medical profession. His papers have hitherto been almost entirely out of the reach of the ordinary medical reader. Many of them appeared in journals which never had a large circulation and which long ago ceased publication. Dr. Taylor must have had a difficult task in collecting these papers and preparing them for publication; and the thanks of the medical profession are due to him for the careful way in which he has carried out his work. It must be understood that Jackson's papers are not easy reading. He is very careful that all his statements are correct. Nor does he avoid the inherent difficulties of his subject. The consequence is that footnotes and subordinate sentences in the text are troublesomely frequent. But reading his papers in sequence as they are printed in these two volumes, one has no difficulty in understanding his views. That much of his work was ignored by his contemporaries is true. No doubt he was possessed of wonderful clarity of vision, far beyond the ordinary. He seems to have realized that he had not carried his colleagues with him, and put it down to want of skill on his part in setting forth his views.

His earlier papers were chiefly on convulsions and convulsive seizures. Fortunately, Ferrier was led by reading one of Jackson's papers to perform his well known experiments on cerebral localization, with results that everybody knows. But Jackson was not always equally fortunate. His work on aphasia, though of great interest and importance, was entirely overlooked by his contemporaries. Fortunately, Sir Henry Head, recognizing their value, made a collection of his papers on aphasia and published them in *Brain* in 1915. Some of these, but not all, are included in the second of these volumes.

In 1871 Jackson published notes of two cases of tumour of the middle lobe of the cerebellum, exhibiting what he called the "cerebellar attitude", with *post mortem* notes in each case. The "cerebellar attitude" is one in which the head is kept extended or thrown back, the trunk rigid, the legs rigid in the extended position, the ankles extended and the toes pointed. The arms are generally flexed at the elbow, the shoulders adducted and the fingers flexed on the palm. This paper, with another, was reprinted in *Brain* in 1906, with sketches taken at the time by Sir Stephen Mackenzie, and with additional notes by Jackson himself.

They are not included in this collection of his papers. He remarks how closely the attitude of these children resembled that of the swift runner, even to the use of a cork for the hand to grasp. In the *Medical Examiner*, April 5, 1877, and March 28, 1878, he published two other papers on this subject, in which he definitely formulated the theory of "cerebellar influx". These two short articles were republished in *Brain* in 1899 by Jackson himself and are included in Volume II of his "Selected Writings", page 452. I quote part of the first article *verbatim*. (The article is written in the third person; why is not clear, as he admits the authorship in the prefatory note.)

> He believes that in health the whole of the muscles of the body are doubly innervated—innervated both by the cerebrum and cerebellum; there being a co-operation of antagonism between the two great centres. Whilst the cerebrum innervates the muscles in the order of their action from the most voluntary movements (limbs) to the most automatic (trunk), the cerebellum innervates them in the opposite order. This is also supposed to be the order of their degree of influence on parts; and it is equivalent to saying that the cerebellum is the centre for continuous movements and the cerebrum for changing movements. Borrowing medical terms to describe normal physiological conditions, the former are tonic, the latter

clonic. The muscles which, on the above suggestions, are chiefly innervated by the cerebellum, are those which have the fewest different, the most tonic, the most confluent movements; the reverse for those which the cerebrum chiefly innervates. Thus, in walking, the cerebellum preserves the equilibrium of the body, tends to stiffen all the muscles; the changing movements of walking are the result of cerebral discharges overcoming in a particular and orderly way the otherwise continuous cerebellar influence. This is what is meant by a co-operation of antagonism.

After referring to the part played by "unantagonised cerebellar influx" in cerebral lesions, for example, hemiplegia, he goes on to say:

The same explanation applies to rigidity of the spinal and other muscles in cases of destroying lesions of the middle lobe of the cerebellum; there is then cerebellar paralysis and cerebral rigidity.

He says in another article recording another case of cerebellar tumour with similar symptoms:

I suppose the cerebellar rigidity to be owing to unantagonised cerebral influx, rigidity in hemiplegia being owing to unantagonised cerebellar influx.

I lay stress on this, as it has not been generally recognized that there is cerebellar paralysis in these cases. He also describes tetanus-like seizures occurring in tumours of the cerebellum, analogous to the epileptiform seizures occurring in cases of cerebral tumour.

There is no doubt that these brilliant and illuminating conceptions met with little, if any, support, and were, in fact, rejected by most neurologists. And when Horsley in 1907 published a lecture on this subject warmly supporting Jackson's views, they were altogether new to most of his readers. Since then Sherrington's well known work on "decerebrate rigidity" has made Jackson's views more widely known. But they have not had the influence on medical thought that they should have had. Probably this is partly due to the difficulty in getting access to his original papers—a difficulty that no longer exists. The common condition known as "meningismus" or "meningeal irritation" can be readily and clearly explained by Hughlings Jackson's hypothesis. No other available explanation is at all adequate. It occurs when there is no meningitis; in pneumonia, for instance, in infancy and early childhood, but never in the adult. If the spasm were due to irritation, would not the muscles of the anterior aspect of the trunk be spastic? It is certain that the abdominal muscles are never in a state of spasm in cases of meningitis. The arms also are almost always free from spasm. The muscles supplied by the cranial nerves are never spastic. Facial spasm is unknown in meningitis. The sterno-mastoids may be spastic, although I have no exact observations on that point, but they serve to keep the neck stiff.

In 1906 a child, two years of age, was under treatment at the Children's Hospital, showing exactly similar symptoms to the two cases described by Jackson. *Post mortem* examination showed a tumour in the left lobe of the cerebellum with secondary hydrocephalus, which often occurs in cerebellar tumours in children, but no meningitis. The interest of the case is that the diagnosis during life was "chronic meningitis" following cerebro-spinal fever, which was epidemic in Sydney at that time. The possibility of cerebellar tumour was not even mentioned, although the child was six months in the hospital and was carefully examined repeatedly. Hughlings Jackson's work seems to have been entirely unknown. It is certain, of course, that there was no "irritation" in this case.

Rigidity of the neck and trunk is a very important symptom in infantile paralysis. Retraction of the neck may be marked. The legs may also be rigid, either one or both being kept in the extended position, with exaggerated knee jerks. Pointing of the toes, as in the cerebellar tumour cases described by Jackson, is not a prominent symptom of infantile paralysis. Rigidity of the arms is rare; I have notes of one case only; in this child the position varied; for the most part they were flexed at the elbow. The "spine sign" of Draper is due to the muscular rigidity of the spine. Draper seemed to think that it was due to a voluntary protection rigidity assumed by the patient to prevent anterior flexion of the spine. But there is no doubt that the rigidity and spasm are quite independent of the will. It is just as marked in the unconscious as in the conscious child. There is spinal paralysis as well as muscular rigidity. In an unconscious child the observer is usually quite unable to flex the spine; any attempt to do so merely increases the rigidity of the neck and trunk and makes it more marked. But tenderness in infantile paralysis may be almost universal and is not confined to the spine. After the muscular rigidity has passed away, which generally happens in a few days, or a fortnight at the most, the cerebellar paralysis becomes more evident. The child lies on its back in bed and is quite unable to sit up. If the medical examiner places his hand behind the shoulders and raises the child into the sitting posture, he (or she) falls back on the bed, absolutely helpless, as soon as the examiner's hand is removed. It is clear that there is a total lack of tone in the muscles of the trunk.

This is all the more striking, as the child can generally use the hands freely; and frequently the legs are not paralysed at all. This spinal paralysis may be recovered from in a few days, but may last for two months. In two or three cases the muscles holding the neck up were still paralysed when the child was discharged after several weeks' treatment in hospital. In one case a leather collar had to be fitted to the neck to keep the head up; but this child completely recovered the use of the muscles of the neck about twelve months after admission to the hospital.

This paralysis of the trunk has been noted before, but has been put down to a widespread involvement of the spinal nuclei. There is no doubt but that this explanation is inadequate. It would be necessary to suppose that the important nuclei of the cervical enlargement and the adjacent nuclei controlling the phrenic had escaped. Moreover, the abdominal muscles are not affected. It is obvious that the muscles involved in the flaccid paralysis

are exactly those that are rigid in the earlier stages of the complaint. Moreover, there is never any wasting of the paralysed muscles. Whereas we know that in cases in which the spinal nuclei are undoubtedly involved, a large percentage of the muscles affected become atrophied. The so-called meningitic type of infantile paralysis should be mentioned here. In this type we have the supposed meningitic symptoms only, without any evidence of the usual spinal paralysis. It is to be supposed that the cerebellum is the organ chiefly affected. These cases usually end in complete recovery without any residual paralysis.

The next question to be asked is: Why should there be a "cerebral influx" in cerebellar paralysis? The answer again is furnished by Hughlings Jackson. The cerebral cortex is the highest part of the nervous system, the last to be developed and the most imperfectly organized; in the infant hardly developed at all and very readily put out of action. In the diseases dealt with in this paper it is rendered functionless by severe and diffuse inflammatory conditions. That being so, the next layer becomes dominant and is over active. This cerebral influx arises in the lower levels of the cerebrum.

Reports of Cases.

ANTERIOR RETINAL DIALYSIS.

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TWENTY years ago Vail considered that 0·1% of patients with detachment of the retina recovered useful vision. Ten years ago Fuchs wrote that a moderate degree of vision was restored in 3·6%, but "unfortunately, it is only in the rarest cases that these good results are lasting". Now any surgeon who applies Gonin's principles faithfully can expect recovery in approximately 50%.

Once the diagnosis is made, busy practitioners are apt to make scanty investigation of hopeless disorders. Therefore, until recently most oculists rarely saw a hole in a detached retina; even large rents, such as anterior retinal dialyses or disinsertions, were missed. These may be fifteen millimetres in length. Only pathologists and the few indefatigable clinicians who delighted in thoroughness appeared to be interested in such rents. Hence German literature, thirty years ago, abounded in references to such conditions. Now "anterior retinal dialysis" returns to ophthalmic literature as an entity and as one that responds to treatment.

An anterior retinal dialysis is a rent in the retina at or immediately behind the *ora serrata*—the line that separates the true retina from its extension over the ciliary region. This retinal zone is characterized by firm attachments to adjacent tissues. The vitreous base is so firmly adherent here that forcible separation detaches the retinal epithelium too. The retina beyond the *ora serrata* is attached to the ciliary pigment epithelium. Therefore, the separation of the retina from its pigmented epithelium is arrested at this line. The retina immediately behind these attachments is particularly thin and fragile. Once a rent appears in this area, the retina lies loosely on its pigmented epithelium until fluid passing through the rent floats the retina away.

The following features are so commonly present in anterior dialyses as to be considered characteristic: (i) There is an inferior temporal site, (ii) it occurs in comparative youth, (iii) the patient is non-myopic, (iv) the patient is a male.

A history of trauma is common amongst such patients, and it is claimed that a causal relationship is frequently present. The inferior temporal quadrant is the part of the retina most exposed to injury. Young males, particularly those not handicapped by short-sightedness, are the most exposed to injury. Football, boxing, and diving may play a rôle in a predisposed eye.

The figures in Table I show the preponderance of these features in my small series.

TABLE I.

Features.	Anterior Retinal Dialysis. Nine Dialyses.	Retinal Detachments in General.
1. Inferior-temporal quadrant	In all	Round holes in superior-temporal quadrant in 53% Horseshoe in superior-temporal quadrant in 47%
2. Age average ...	Twenty-nine years	61% over 40 years
3. Refraction	One eye was myopic. Average refraction, + 2·0	66% myopic Average of 19 patients, −11·3 dioptres.
4. Sex	All of 8 patients male	66% males.

Of the eight patients, six have been operated on. One of these, R.K., had arteriosclerosis, and though he detected after operation a preliminary improvement in vision, a hæmorrhage into the vitreous about the tenth day prevented an accurate observation of his retina. The vitreous is, however, gradually clearing, and sixteen months later his vision is $^{6}/_{60}$.

TABLE II.
Showing particulars of patients operated on.

Initials.	Age.	Refraction.	Operations.	Punctures.	Vision before Operation.	Vision after Operation.	Interval.	Extent of Dialysis.
K.L.	39	$\frac{+1·0}{+1·5}$	1	4	$^{6}/_{18}$	$^{6}/_{5}$	18 months	6 to 11 o'clock
G.W.	16	+0·5	1	2	$^{6}/_{60}$	$^{6}/_{18}$	14 months	3 to 6 o'clock
F.D.	23	$\frac{-4·0}{-2·0}$	3	6	$^{6}/_{60}$	$^{6}/_{18}$ (partly)	6 months	7.30 to 10.15 o'clock
N.McP.	23	$\frac{+1·0}{+1·0}$	1	3	$^{6}/_{60}$	$^{6}/_{9}$ (partly)	2½ months	5.45 to 7.30 o'clock
C.B.	14	$\frac{+4·5}{+2·0}$	1	3	$^{6}/_{36}$ (1)	$^{6}/_{36}$ (1)	4 months	5.30 to 9 o'clock
R.K.	54	+3·0	1	2	$^{6}/_{60}$	$^{6}/_{60}$	16 months	3.15 to 7.15 o'clock

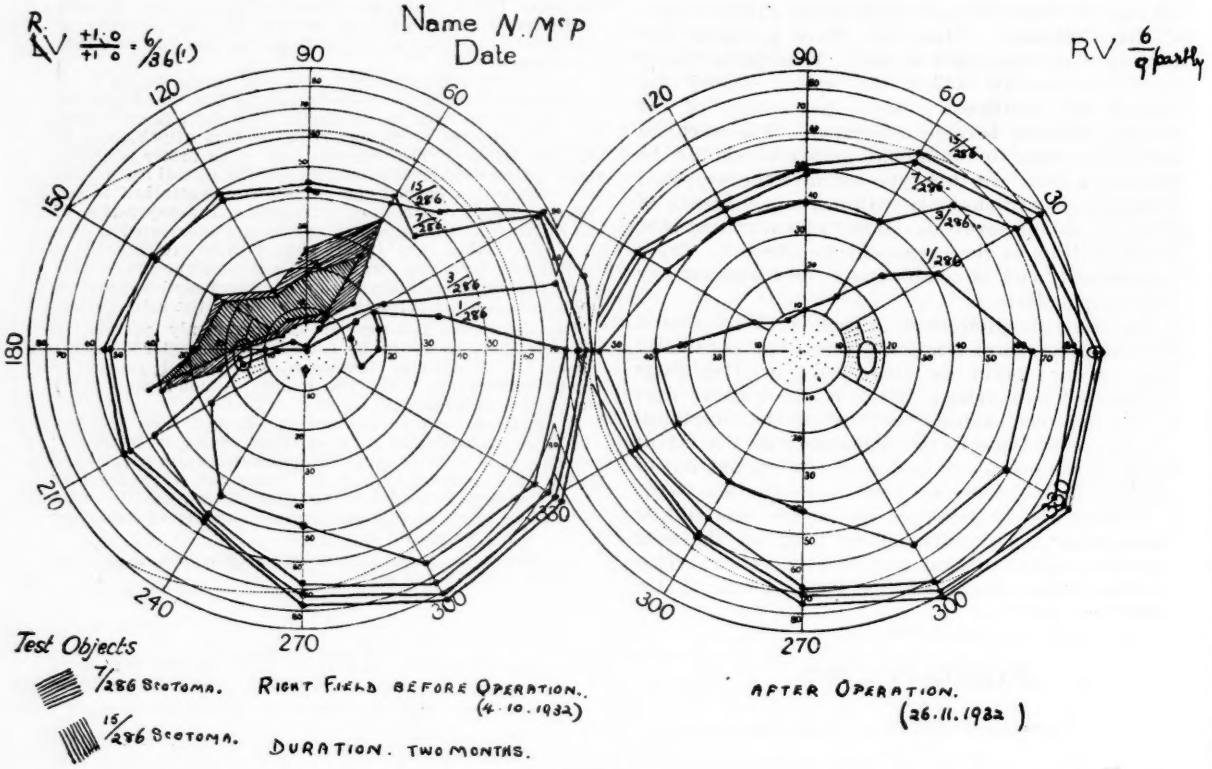

FIGURE I.

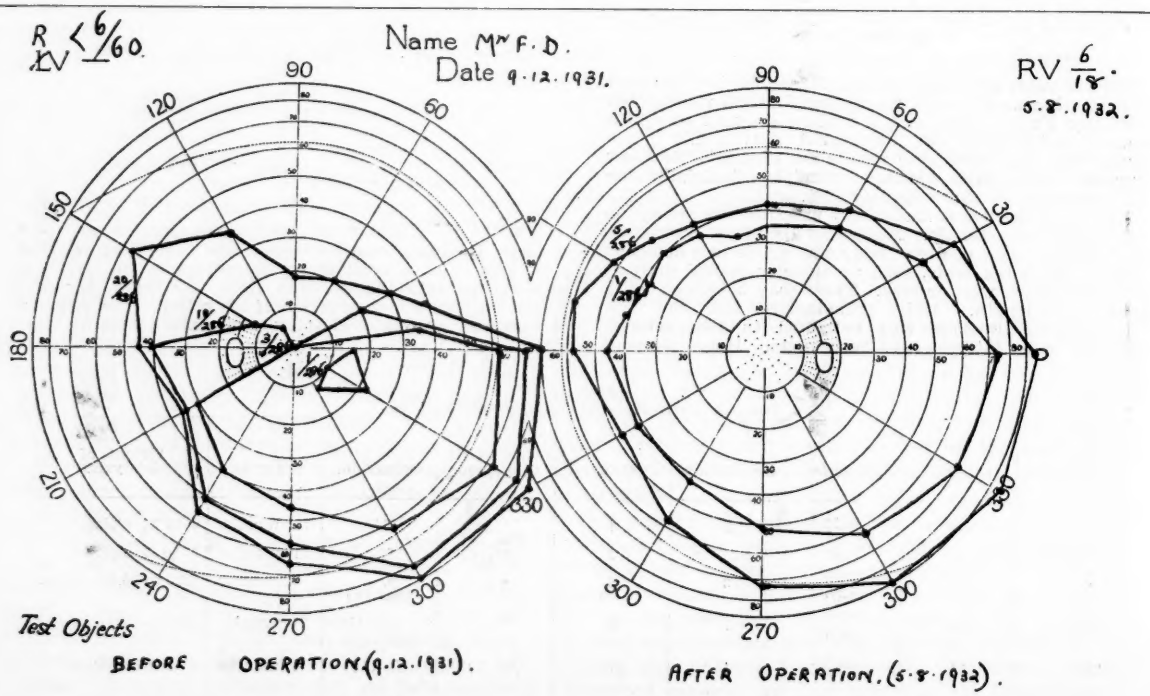

FIGURE II.

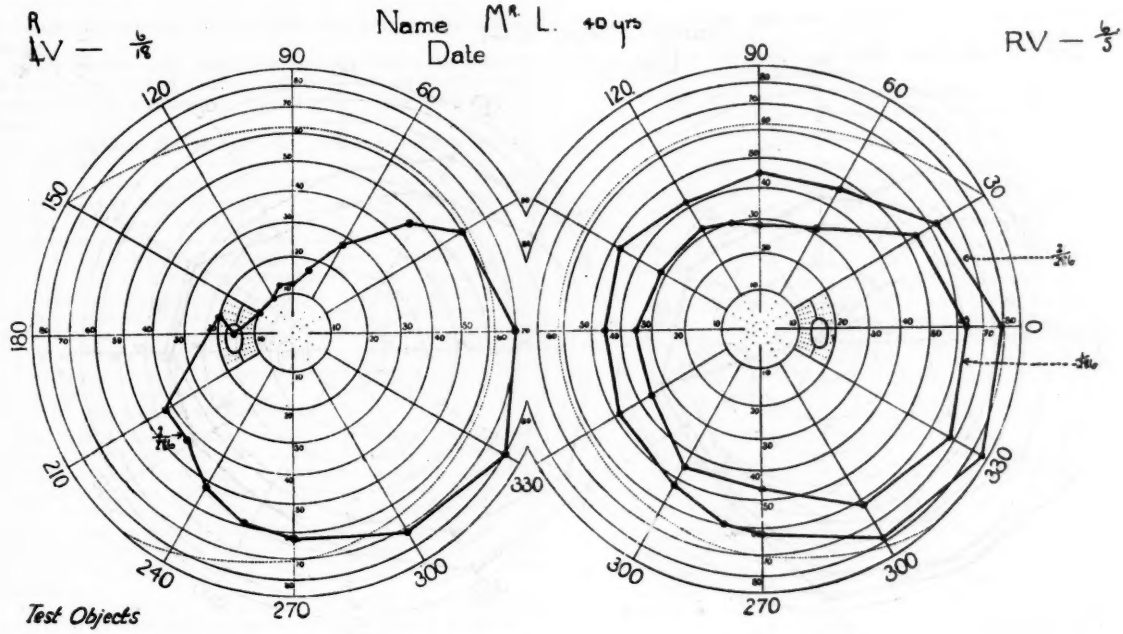

FIGURE III.

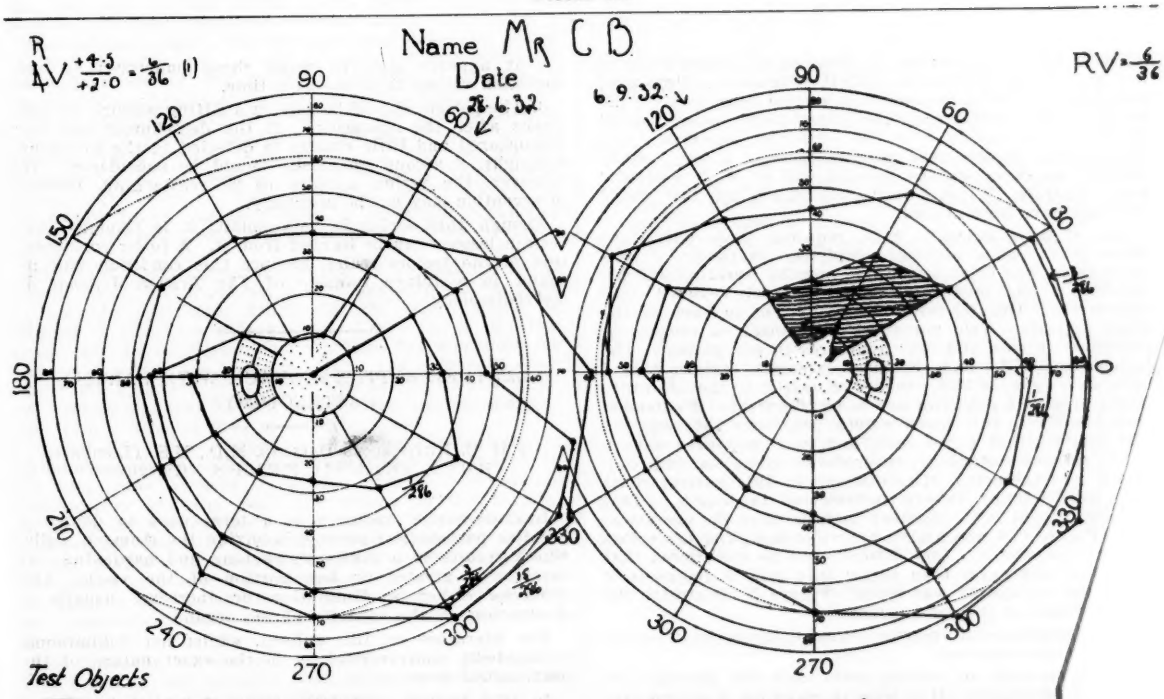

FIGURE IV.

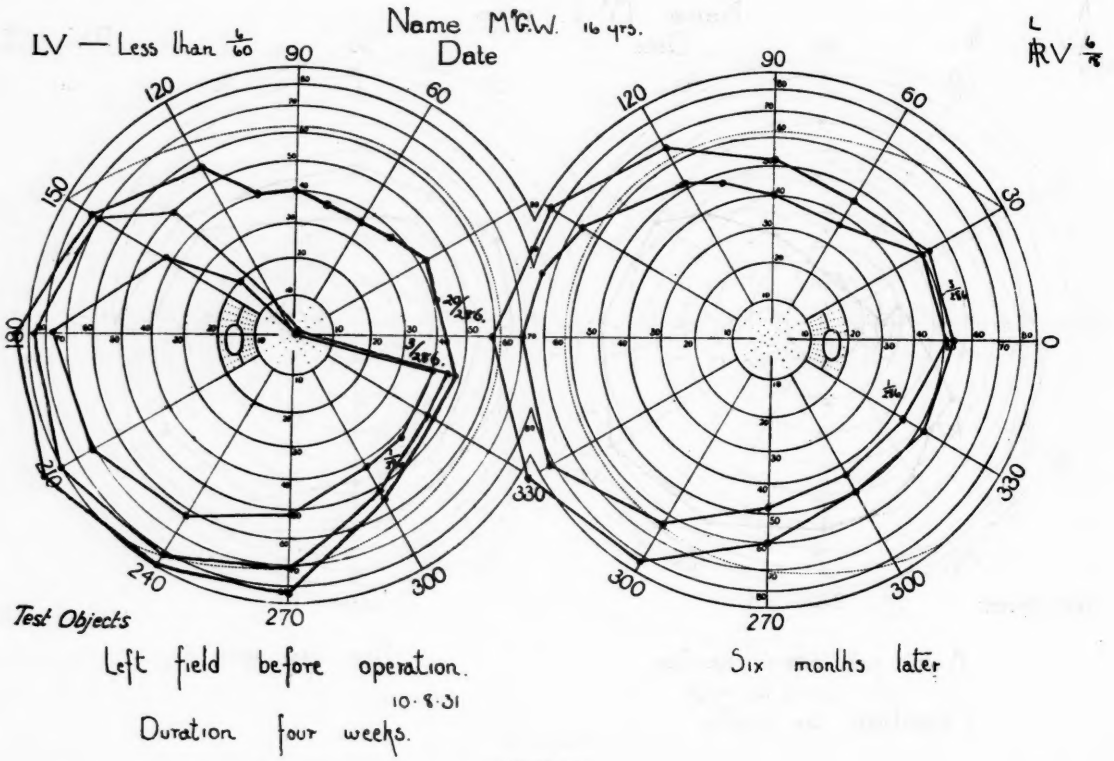

FIGURE V.

The value of recognizing the frequency of these features was manifest in the case of N.McP. (Figure I). Prolonged examinations failed to reveal a retinal tear, but as the patient was young and the detachment was situated inferiorly, a dialysis in the inferior quadrant was anticipated. It was just possible through a very cloudy vitreous to recognize the pointed end of what evidently was a dialysis. Without such anticipation this tear would probably have been missed.

One of these patients, F.D., required three operations before his retina became completely reattached. His detachment was of at least three months' duration and his field to a one millimetre object scarcely existed (see Figure II). One operation was sufficient in each of the other patients. Two punctures were made in two, three punctures in two, and four punctures in one patient. The last patient, K.L., had the most extensive dialysis that I have seen (Figure IV). Indeed, a search of the literature fails to reveal a report of one of equal extent. It extended from the six to the eleven o'clock position. This was the first dialysis that I had seen, and four punctures with a small galvano-cautery point produced complete and continued reattachment. The dialysis in this patient must have been almost twenty millimetres in length. This patient's vision is $^{6}/_{5}$, eighteen months after the operation. C.B. (Figure IV) was highly hypermetropic, and the vision in each eye was $^{6}/_{36}$ (one letter). As he considered that his vision had never been better than this, a diagnosis of congenital amblyopia was made. Figure V illustrates the field of vision of the patient G.W.

In the treatment of anterior retinal dialysis the following points require emphasis:

1. The necessity of making more than one puncture for all but minute rents. It is wise to make the first puncture either opposite or immediately posterior to the posterior margin of the dialysis and then one opposite each of its extremities. If the dialysis is larger, as in K.L., an extra puncture may be required.

2. It appears wise to make these punctures at one operation rather than one at a time.

3. The patient should be kept in a sitting posture for two weeks after the operation. If the detachment has not disappeared and little change is detected in the following fortnight, a second operation should be considered. If, however, the retina appears to be reattaching, further intervention may not be necessary.

Though this series is very small, it is thought that certain lessons can be learned from it. A fuller consideration of the factors which produce this condition will be found in a future number of *The British Journal of Ophthalmology*.

LEATHER BOTTLE STOMACH WITH PARTIAL GASTRECTOMY.[1]

By H. C. RUTHERFORD DARLING, M.D., M.S. (London), F.R.C.S. (England), F.F.R.P.S. (Glasgow).

LEATHER-BOTTLE STOMACH is a term used to denote a peculiar pathological process involving the stomach walls, which results in a diffuse thickening and hardening. It involves a greater or less portion of the viscus, and produces either a diminution or increase, usually a diminution, in the capacity of the organ.

The literature on this subject, whilst not voluminous, is decidedly controversial as to the exact nature of the pathological process.

In 1854 Brinton coined the name of *linitis plastica*, on the assumption that the lesion was essentially a benign

[1] Read at a meeting of the Staff of the New South Wales Community Hospital on May 5, 1932.

inflammation of the filamentous network in the areolar tissue.

Lyle's monograph, published in 1911, gives an abstract of one hundred and thirty cases reported up to that date, together with a complete bibliography. Lyle's conclusions were:

1. Diffuse fibrosis of the stomach occurs without cancer.
2. A large number of the cases reported are frankly cancer and have no claim to be termed *linitis plastica*. On the other hand, some of the cases reported as *linitis plastica* are scirrhous cancer.
3. The clinical diagnosis is rarely possible and at the best is always problematical. The microscopical diagnosis necessitates a careful and prolonged search for nests of cancer cells in order to exclude scirrhus.
4. There is a possibility that the condition may be a precancerous state, bearing somewhat the same relation to scirrhous cancer that gastric ulcer bears to gastric carcinoma.
5. The treatment is surgical.

Since 1911 one hundred and forty further cases have been collected; of these the authors classed ninety-six as malignant and thirty-eight as benign, including those due to syphilis. In six the nature of the process was not stated.

The condition is slightly more common in men than in women, and is essentially one of adult life. Whilst the ages of patients vary from ten to seventy-one, the great majority of patients are in from the fourth to the sixth decade.

The gastric walls exhibit a diffuse thickening and a lack of flexibility with loss of the normal glistening appearance of the overlying peritoneum. Not only are the walls thickened, but on section they appear to be hard and fibrous, and show remarkably few vessels, so that there is a characteristic bloodless appearance. On microscopic section, the fundamental lesion is the enormous development of fibrous tissue in the submucosa and subserosa. In the muscular coat the fibrous tissue spreads between the muscle fibres and completely replaces them.

The localized type of the disease is most commonly found in the pyloric region. It has the same characteristics as the diffuse variety, but involves only about one half of the stomach and fades away into the normal tissue.

There are no distinctive symptoms, and those presented are due to a gradual loss of the normal function of the stomach from a slow decrease in its size and to the development of cardiac or pyloric stenosis, usually the latter. Achlorhydia, with decreased total acidity, is commonly found together with a moderate secondary anæmia. Hæmatemesis and blood in the stools are rare findings.

The most important single method of examination is the opaque meal, which reveals a very characteristic picture. In an advanced case, practically the whole organ is reduced in size to a narrow tube. There are no contractions, and the food passes out through the duodenum as fast as it enters the stomach. In a less advanced case, whilst the pyloric portion is reduced to the tubular form, the cardiac end may be still more or less normal looking, and form a kind of food reservoir.

Under the name leather-bottle stomach a variety of pathological processes have apparently been described. In the past, most authors have been divided between the inflammatory and the neoplastic origins of the malady, but today most pathologists believe that the vast majority of cases are due to a sclerosing fibro-carcinoma of very low malignancy. This decision has been arrived at through the careful histological examination of serial sections of the stomach wall in addition to the routine sectioning of the lymphatic glands along the greater and lesser curvatures.

The following patient who was referred to me by Dr. Cecil Coghlan, has recently been under my care at the New South Wales Community Hospital.

E.A., a female, aged sixty-two years, was admitted to hospital on March 25, 1932, complaining of epigastric pain of about ten months' duration. The pain, which was "gnawing" in character, generally occurred about 11 a.m. and 4 p.m. daily, and was relieved by taking a glass of milk. For the last six months her meal had consisted chiefly of milk and bread and butter, as meat and vegetables were found to induce nausea.

There had been a loss of 17·5 kilograms or thirty-nine pounds (67·9 kilograms or ten stone eleven pounds to 54 kilograms or eight stone eight pounds) in weight during the last nine months.

For six months the bowels had been obstinate, and an evacuation could be secured only by taking either a Seidlitz powder or four aperient pills on alternate days. Except for an attack of retention of urine two years ago, which was relieved by catheterization, she had always been strong and healthy.

On physical examination, apart from a tendency to become scaphoid in shape, the abdomen presented no abnormal physical signs. The Wassermann test yielded no reaction. The fractional test meal revealed an absence of free hydrochloric acid. Pus cells, red cells, eosinophile cells and many streptococci were present. Examination of the urine revealed no abnormality.

The X ray report stated that the position of the stomach was normal for this type. The tone was good. Peristalsis was absent in the pyloric third. The emptying time was three hours. There was a slight constriction of the extreme pyloric third for about 5·0 centimetres (two inches) proximal to the pylorus. The X ray appearance was strongly suggestive of an early scirrhous carcinoma.

The meal passed rather rapidly thorugh the pylorus. The duodenal bulb filled easily and appeared normal.

Operation was performed on April 1, 1932. It consisted of an exploratory laparotomy under "Avertin" anæsthesia. The gall-bladder and adjacent under-surface of the liver were adherent to the pyloric portion of the stomach over an area about the size of the palm of the hand. On separation of the adhesions, a hard tumour the size of a walnut was found at the pylorus with a tongue-like extension along the lesser curvature. Two enlarged firm discrete glands were felt in the sub-pyloric region.

Partial gastrectomy was performed by the retrocolic short loop modification of Pólya's original operation.

The patient made an uninterrupted recovery, and was discharged from the hospital on April 28, twenty-seven days after the operation.

A pathological investigation of the stomach was made by Dr. Eva A. Shipton, Her description of the specimen was as follows:

> The stomach shows marked thickening of the wall which is more marked in the pyloric region. The lumen shows definite contraction throughout. No definite tumour is present.

Dr. Shipton's report on the microscopic appearances was as follows:

> Sections of the pyloric portion of the stomach show well marked fibrotic thickening thorughout the submucosa and muscular coats.
>
> Sections were cut from seven parts of the stomach, but in six no neoplastic cells could be found.
>
> There was some definite malignant change in one part of the mucous coat and scattered malignant cells could be seen throughout the fibrous tissue of the other coats. Sections through the cardiac end showed no malignant cells. Sections from two glands showed no evidence of involvement by neoplasm.

When seen on November 15, 1932, the patient had developed early ascites, presumably due to secondary malignant peritonitis.

Reviews.

THE PHARMACOLOGY OF THE SOUTH AFRICAN FLORA.

PROFESSOR J. M. WATT and his co-author, of the Pharmacology Department in the University of the Witwatersrand, Johannesburg, have produced a classic dealing with the plants of Southern Africa, "being an account of their medicinal uses, chemical composition, pharmacological

effects and toxicology in man and animal".[1] Much of the folk medicine of the South African native tribes is vanishing, as civilization, with its synthetic remedies, advances. This work forms a permanent record of such native practice and much else besides. Different indices deal with the botanical names of plants; English and Africaans names (including names of diseases caused by plants); native names and active principles. The subject matter is arranged according to botanical families. One rather unfortunate omission is that rarely is an indication given as to whether the plants mentioned are indigenous to South Africa or introduced. Thus we note that several species of Australian wattle (Acacia) are included without any reference to their country of origin. It is the irony of fate that much tannin-containing wattle bark is imported into Australia from South Africa—the species yielding the bark having originally been introduced into South Africa from Australia. Various Australian eucalypti are also included, but rightly the country of their origin is indicated. Many arrow poisons are mentioned. *Buphane disticha* is used by the Hottentots for poisoning arrows used in shooting small game. It contains buphanine, an alkaloid acting like hyoscine. *Acokanthera venenata* also yields an arrow poison and is likewise used as a remedy for snake bite. Other arrow poisons and snake bite remedies are mentioned. Among the latter are the leaves of Indian hemp (*Cannabis sativa*), *Capparis tomentosa* and *Indigofera tristoides*. Jequirity (*Abrus precatorius*) is fully described and it is mentioned that in India it is used for homicidal purposes. Many fish poisons are described as being used by the native tribes. The fish are quite edible when thus poisoned. *Tephrosia vogelii* yields a toxic principle, tephrosin, especially lethal to fish, much less lethal, when given orally, to other animals. The minimum fatal concentration to fish is one in fifty million. Rabbits and dogs, however, can be killed by hypodermic injections. Many stock poisons are described, including the Australian Darling pea (Swainsona). The disease called "dikoor" in young sheep is caused by *Panicum maximum*. The diverse effects on different animals of our white cedar (*Melia azedarach*) are well described. The poisonous effects of the oleander on man and beast are mentioned, but the authors do not believe that smelling the flower can produce toxic effects. The fruit of *Solanum pseudocapsicum* are sometimes toxic. It is said that in Australia young plants of the Bathurst burr (*Xanthium spinosum*) are poisonous, but authority is quoted for the assertion that such plants are not poisonous under field conditions. Poisonous fungi (Amanita) are mentioned. The beautiful African daisy (Gerbera) has a place in aboriginal medicine. Doubt is thrown on the use of Lochnera (*Vinca rosea*) in diabetes. *Strychnos henningsii* yields an alkaloid different from both strychnine and brucine and *Strychnos spinosa* is employed for snake bite. An intoxicating drink is made from *Phœnix reclinata*.

The book contains a wealth of information and makes one wonder if ailing humanity would not be better served by a close investigation of aboriginal medicine and pharmacological investigation of plants rather than by the endless manufacture of synthetic compounds in the laboratory. The coloured illustrations of plants are excellent. The black and white illustrations largely depict the attitudes of animals poisoned by plants. Only one misprint was noticed. Thymelaceæ in the index should read Thymelæaceæ.

CARDIAC DISEASE.

DR. C. BRAMWELL'S little book on heart disease is based on a series of lectures delivered to students at the University of Manchester in 1929.[2] The author has chosen those conditions and symptoms which seem to him most important and has not tried to cover the whole field. It seems, however, a pity that in many cases the discussion is rather slight, for a somewhat fuller treatment would add much to the interest of the book. The chapter on the heart in athletes is very welcome, as the author has done much careful and valuable work on this subject, and his thoughtful review of ascertained facts should be of great value to those who have to give advice as to the amount and kind of sport in which boys and young men should indulge.

The term "anginal heart failure" seems an unfortunate one to use in addressing students, as the word angina has a very depressing effect on patients and is much better avoided, but though one may dislike the word, the chapter on cardiac pain and its features would be very valuable to students, for it contains in small compass an admirable review of the subject. The cardiac irregularities are discussed very satisfactorily in a few short chapters which contain most of the important facts, and in the chapter on auricular fibrillation the author emphasizes the important fact that "either the auricle is fibrillating or it is not fibrillating". There is no half-way house, as students and many practitioners seem to believe, and appreciation of the absolute difference of this condition from normal rhythm is essential. Structural lesions, rheumatism, syphilis *et cetera* are discussed, also cardiac intoxications, arteriosclerosis and hyperpiesis, and the subject of treatment, though handled in a general way rather than in detail, is well done, and the student will find much sound and helpful criticism. On the whole the book gives an excellent short account of cardiac problems.

MALINGERING.

As stated in the preface by Sir John Collie, his book, "Fraud in Medico-Legal Practice", may be regarded as a revised and abridged edition of his former book, "Malingering".[1]

The author is a man of great experience in the examination of the injured worker, and any medical man doing similar work must derive benefit from a study of this little book. Starting off with the statement that unless unjust claims are sternly repressed, the burden upon the community will be greater than it legitimately should be, the author gives many ingenious methods of detecting the fraudulent claimant. Experience shows that a medical witness will rarely state openly his opinion that a claimant is a malingerer, but no doubt the court draws its own conclusions as to the meaning of the medical evidence in this direction. The author deals with this matter of straightforward statement in discussing the question of privilege in making medical reports on claims. Such difficult questions as hernia and injury to the back are fairly fully considered, and the author takes what may be regarded as a liberal view of these claims. Claudius Galen is quoted as saying "Employment is Nature's physician and is essential to human happiness".

We can safely say that Sir John Collie has produced an interesting and instructive book.

Notes on Books, Current Journals and New Appliances.

SOLDIERS' PETS.

MANY amusing stories are to be told about animal pets kept by soldiers during the Great War. "Bud the Monkey", by Lin MacDonald, is a book about soldiers' pets, illustrated by Angus MacDonald.[2] An introduction by General Sir Ian Hamilton concludes with the words: "Always back a Mac, but if you get two Macs in a combine—put your shirt on!" This book will appeal to members of the Australian Imperial Force.

[1] "The Medicinal and Poisonous Plants of Southern Africa," by J. M. Watt, M.B., Ch.B., and M. G. Breyer-Brandwijk; 1932. Edinburgh: E. and S. Livingstone. Crown 4to., pp. 334, with illustrations. Price: 25s. net.

[2] "Heart Disease: The Principles of Diagnosis and Treatment," by C. Bramwell, M.A., M.D., F.R.C.P.; 1932. London: Edward Arnold and Company. Demy 8vo., pp. 251, with illustrations. Price: 12s. 6d. net.

[1] "Fraud in Medico-Legal Practice," by Sir John Collie, C.M.G., M.D.; 1932. London: Edward Arnold and Company. Demy 8vo., pp. 286, with illustrations. Price: 10s. 6d. net.

[2] "Bud the Monkey and Other Tales of Soldiers' Pets", by L. MacDonald, illustrated by A. MacDonald, with introduction by General Sir Ian Hamilton; 1932. Australia: Angus and Robertson, Limited. Crown 4to., pp. 136, with illustrations. Price: 5s. net.

The Medical Journal of Australia

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IDEALS.

DURING this year medical investigators throughout the world have been diligent in their search for truth. Though the volume of published material from laboratories and research institutes is no criterion of new discovery, progress has been made in many directions. Medical teachers have tried to show to their pupils where their youthful feet must be set in the path of inquiry and in the pursual of virtue—the word here being used in its older comprehensive sense. The scientific ideal has been put forward as that more likely in its pursuit to advance the practice and redound to the honour of medicine. We may, moreover, presume that each practitioner has in his own sphere followed what he conceives to be the way of duty. Pursuit of knowledge, search for truth and devotion to duty are expected of a man of science, and they will be of ultimate value to him only if his motives are not those of material gain and bodily comfort. This value will come to him in his own life and will be reflected in his inward satisfaction and in his ability to strive for higher achievement.

Life is more than the passage from the cradle to the grave; man has, or rather is, a soul, a spirit. He has a destiny to fulfil. He is not "the plaything of a whim, a toss of Chance with loaded dice of Death". On the other hand, he is not completely master of his fate, Henley notwithstanding. He has, however, within him the power of developing his character, of knowing the best and of striving to attain it. To say that a man has ideals is to say that he recognizes for attainment or emulation a perfect type of being or of doing. The Man with the Muck-Rake, seeing only his straws and small sticks, might have been content with his lot. There are many like him. Again, many people, probably as a result of early training, follow unconsciously the good that is in them, without setting up for themselves any standard of attainment. But there are happier folk who, knowing the danger of the joust and the hardship of the quest, would rather put on the armour of the knight to strive for the king in the cause of truth and mercy. Others again, and they are few, while not forgetful of their knight-errantry, seek to develop the highest that is in them, to know the meaning of life and to discover their place in the cosmos. This development of the spirit is the most absorbing and at once the most humiliating and uplifting of all pursuits.

The setting up of an ideal connotes height and distance—height to be scaled and distance to be travelled before the objective can be gained. The ideal may be set up for a man or it may be of his own creation. In either case there will be need for continual striving, possibly for conflict and surely for endurance. But before a man can strive for an ideal he must recognize it. The extent of his field of vision will depend on the state of his soul's development. Edna St. Vincent Millay expresses this truth:

> The world stands out on either side
> No wider than the heart is wide;
> Above the world is stretched the sky,
> No higher than the soul is high.
> The heart can push the sea and land
> Farther away on either hand;
> The soul can split the sky in two,
> And let the face of God shine through.
> But East and West will pinch the heart
> That can not keep them pushed apart;
> And he whose soul is flat—the sky
> Will cave in on him by and by.

Once the climb has started, the range of vision becomes wider with each upward step and the soul may be enriched by each new experience. The

footsteps must be watched; a new gain imperfectly seen or wrongly regarded will be like a loose or rolling stone to the climber and ground will be lost; and to make a second ascent is less inspiring and more wearying than to make the first. There can be no standing still; he who does not go forward, will surely go backward. There is thus need for what Francis Thompson calls "a will accipitrine to pursue". He who pursues his ideals and who would be uplifted spiritually will not be content with Francis Thompson's alternative, "a heart less native to high Heaven"; there is no place in this "heavenly falcon-craft" for "a hooded eye, for jesses and restraint". The nearer man approaches his ideals, the fuller will be his knowledge and the deeper his understanding of the meaning of life; but withal the greater will be his burden. That he will be bound to lend a helping hand to others is but one side of his duty, and by helping others he will make his own foothold more secure. He will continually have to take heed to himself lest he fall. Though he who has knowledge and understanding may not easily fall, yet the higher the fall, the more severe will be the hurt:

> Low they fall whose fall is from the sky.
>
> . . . . . .
>
> . . . the lowest reach of reeky Hell
> Is but made possible
> By foreta'en breath of Heaven's austerest clime.

Though the way be a way of pain as well as of joy, to attain the heights is an objective worthy of lifelong devotion.

Current Comment.

BOTULISM.

SCATTERED outbreaks of botulism have occurred from time to time in many countries. The origin of each recognized outbreak has been found to be food infected with *Bacillus botulinus*. In the earlier outbreaks the source of infection was believed to be meat, particularly improperly preserved sausage meat. Within recent years it has been found that foods of other kinds may carry infection. In the United States of America especially, vegetables preserved in the home by methods that do not effect complete sterilization, have been proved to be responsible. The bacillus of botulism appears to be a comparatively rare organism, requiring special conditions for its development and multiplication. The isolation and infrequency of the outbreaks of the disease make more difficult the study of its epidemiology and the natural conditions in which *Bacillus botulinus* can survive and flourish. Doubtless some outbreaks of so-called ptomaine poisoning have been outbreaks of botulism; it is possible that some such outbreaks have passed unrecognized in Australia. Be that as it may, the deadliness of the disease demands that its symptoms should be known and that medical practitioners should bear in mind the possibility of its occurrence.

Robert W. Allen and A. Walter Ecklund have recently made a report on an outbreak of botulism that occurred in North Dakota early in 1931.[1] In this outbreak there were thirteen patients, all of whom died. Seventeen persons attended a supper party, at which, among other items, preserved vegetables were served as a salad. One of the guests ate no salad; three others ate salad, but vomited shortly afterwards; the remainder (thirteen in number) ate and retained the salad and later died of botulism. A section of colon obtained *post mortem* from one of the patients was examined bacteriologically and found to contain *Bacillus botulinus A*. A sample of the actual salad served at the party was not obtainable; examination of samples of similar material, which had been prepared for preserving, together with the material served at the party, revealed no *Bacillus botulinus*. Despite this, and despite that the members of the host's family had eaten preserved vegetables of the same "batch" during the previous few months, there seems to be little doubt that these canned foods were the source of infection. This serves to emphasize further the difficulty of studying *Bacillus botulinus* in its natural environment. Until some means is discovered of studying the natural habitat of *Bacillus botulinus* and the endemiology of botulism, the prevention of the disease will remain an unsolved problem.

The period of incubation in the North Dakota outbreak varied from 16 to 108 hours, the average being 31·8 hours. The duration of the disease varied from 12 to 120 hours, the average being 34·5 hours. In each case death was due to either strangulation (the result of pharyngeal palsy) or respiratory paralysis. In one instance the heart continued to beat for six minutes after respiration had ceased. The illness following the longest incubation period was of the longest duration. The outstanding symptoms were as follows: diplopia, dimness of vision, difficulty in speech proceeding to complete aphonia, constipation, inability to protrude the tongue, muscular weakness, and restlessness. The temperature was subnormal in all but two cases, in which it was raised slightly above normal. The pulse rate was not usually very rapid until just before death. At *post mortem* examination the internal organs, especially the brain and spinal cord, were observed to be congested. There were slight congestion of the basal ganglia, chromatolysis of the ganglionic cells, and disappearance of Nissl granules.

[1] *The Journal of the American Medical Association*, August 13, 1932.

In a known endemic area the diagnosis of botulism should not present any great difficulty, at any rate when there are several cases with a common origin. The medical practitioners attending the patients in the North Dakota outbreak made the correct diagnosis prior to the death of the first patient. There may be some difficulty in diagnosis when only one person is affected, especially in a place not recognized as an endemic area.

The only treatment of any value is the administration of botulinus antitoxin. It was not used in the North Dakota outbreak, as it was not available until twelve patients were dead and the thirteenth was ill. The antitoxin seems to be a valuable prophylactic, and should be administered to all who have partaken of food believed to be contaminated with *Bacillus botulinus*. It should be noted that a combined *Bacillus botulinus A* and *B* antitoxin is necessary, as administration of antitoxin for the one type of bacillus does not protect against attack by bacilli of the other type. Allen and Ecklund recommend that the "proper procedure in home canning of foodstuffs and their preparation before serving should be given the greatest possible publicity".

In Australia the preservation of foods in the home is widely practised, but not to such an extent as in the United States of America. Possibly in Australia people are better educated in the preparation of foods and the care that is necessary to prevent infection; at any rate it seems clear, as Morris pointed out recently before a meeting of the Australian and New Zealand Association for the Advancement of Science, that the various pure food laws have taught Australians to be particular in the selection of foods. It scarcely seems likely that botulism will ever become a menace in Australia, if, indeed, it ever occurs; but the possibility of its occurrence should not be disregarded.

EXOPHTHALMOS.

THERE has been some conjecture concerning the pathology of the exophthalmos that accompanies thyreotoxicosis; but there seems to have been little done in the way of scientific investigation. In view of the clinical importance attached to exophthalmos, this is at least surprising. In a paper read before the Section on Surgery, General and Abdominal, at the Eighty-Third Annual Session of the American Medical Association, Howard C. Naffziger and O. W. Jones discussed the pathology of thyreotoxic exophthalmos and the surgical treatment for it.[1] Naffziger and Jones point out that exophthalmos does not always subside after satisfactory surgical treatment of Graves's disease; in fact, it sometimes progresses until the lids are no longer able to cover the globe. In such cases the lids become thickened, the conjunctiva becomes œdematous, and the movements of the eyes become greatly restricted; optic atrophy may develop; and there is, of course, the danger of corneal ulceration and panophthalmitis.

[1] *The Journal of the American Medical Association*, August 20, 1932.

Naffziger and Jones state that progressive exophthalmos following thyreoidectomy is due to progressive swelling of the orbital muscles. These muscles are three to eight times their normal size. Microscopic examination reveals œdema, infiltration with round cells, increase of fibrous tissue, areas of hyalinization, and fragmentation and destruction of muscle fibres. The amount of orbital fat is not increased and there is no increased vascularity of the orbital contents.

The object of the operation designed by Naffziger and Jones is the provision of sufficient space for the accommodation of the increased orbital contents. It should not be regarded as a cosmetic operation; they state that it should be employed for the relief of persistent and progressive exophthalmos only. It consists in raising a flap of the frontal bone on either side of the mid-sagittal line, dissecting the *dura mater* as far as necessary from the anterior cranial fossa, removing the roof of either orbit, widely opening the orbital fascia, dissecting downwards, and opening the annulus of Zinn. Temporary œdema and exaggeration of the exophthalmos occur immediately after operation; this subsides after a few days. Improvement commences within a fortnight and continues for many months. The movements become more extensive, the vision improves, retinal hæmorrhages and swelling of the optic disks disappear, and the exophthalmos diminishes greatly. Four patients have been operated on by Naffziger and Jones, and two by other surgeons. There has been no death nor any serious post-operative complication; results have been satisfactory in each instance.

The most interesting feature of this communication is the statement concerning the pathology of exophthalmos. Further investigation will be necessary before it can be said whether the swelling of the orbital muscles is the primary factor. Although Naffziger and Jones found no other obvious cause for the exophthalmos, one may have been in operation during the period of thyreotoxicosis. If the muscular lesion is directly due to thyreotoxicosis, similar lesions might be expected to occur in other voluntary muscles. On the other hand, the view expressed by Foster Moore and others, that the exophthalmos is due to excess of orbital fat, is open to several objections. Why, for instance, should the orbit be selected for the deposition of fat when the rest of the body is emaciated? It might also be asked how the investigators reached the conclusion that there was excess of fat in a cavity that is normally full of fat. It remains to be proved whether the excessive quantity of fat—if it is excessive—is the cause rather than an effect of the exophthalmos. It seems likely that there are several factors.

The operation described by Naffziger and Jones is an extensive one, even in these days, when intracranial surgery has ceased to be regarded with awe. No doubt there is a place for it; it must be kept there.

British Medical Association News.

SCIENTIFIC.

A MEETING OF THE VICTORIAN BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at the Commonwealth Serum Laboratories, Royal Park, Victoria, on September 7, 1932.

DR. F. G. MORGAN, the Director of the laboratories, after welcoming the visitors, outlined the scope of the work performed at the laboratories, which he said could be arranged under the headings of educational, public health, research (original and applied), and manufacturing. Examples were given illustrating this. For a number of years the laboratories had been entirely and continuously self-supporting. Any profits which accrued were devoted to further development and research, in so far as this was permitted by the authorities.

The visitors were then shown the general disposition of the laboratories and were conducted through several of the departments engaged in making biological products, later proceeding to the demonstrations which had been especially arranged for the programme of the afternoon.

Basophilic Stippling.

In the absence of Dr. W. T. Nelson, Dr. Morgan demonstrated Dr. Nelson's method of using darkground illumination for the detection of basophilic stippling. By the use of this method it is possible readily to detect all grades of stippling in erythrocytes. A paper, embodying the most recent data upon the subject of basophilic stippling, using this method, was already in the press. It was claimed that the use of the method threw new light upon the problem of the significance of basophilic stippling in normal persons and in those suffering from industrial and other diseases.

Biological Standardization.

DR. J. A. BROBEN discussed the principles of biological standardization and exhibited and explained the methods employed in assays of insulin and pituitary extract.

The obvious desirability of accurate standardization of all therapeutic agents was stressed. In many instances assay on a chemical basis was possible and the securing of uniformity of potency presented no great difficulty. Physicians were, however, employing an increasingly large group of very active substances of unknown chemical constitution; agents so potent that standardization was absolutely necessary, and biological assay was in many cases the only means of determination of therapeutic activity.

The term "physiologically standardized" (when used in connexion with a biological product) could, however, be very misleading and practically devoid of real significance unless certain fundamental principles were recognized and fallacies avoided. No biological assay was of serious value unless performed with reference to a stable standard.

In the case of pituitary extract it had been shown by Dale that various preparations examined in England in 1932 (each preparation labelled "physiologically standardized") differed to such an extent in potency that one preparation was actually eighty times as strong as another. The dangers involved were too obvious to require further emphasis.

As regards insulin, the original unit was defined simply interms of an "animal reaction"; the production of a stated degree of hypoglycæmia, or the occurrence of convulsions in the rabbit. Thus the value of the unit employed by each manufacturer was influenced by the behaviour of the particular animals used for assay.

Under the auspices of the League of Nations, international reference standards for insulin and pituitary extract had been prepared, and units of activity could now be defined in terms of measured quantities of the actual substances composing these standards. Having acquired such standards for reference, it remained for the manufacturer physiologicaliy to assay his product by comparison with the standards.

Dr. Broben then referred to the other principles which must underlie any method of assay adopted. No method was sound or capable of producing reliable results unless it either eliminated the variability of the living reagent employed or estimated such variability and allowed for it.

There were two kinds of variation: (*a*) the relatively persistent differences of sensitivity between one individual and another, and (*b*) the differences in the same individual from day to day, or in a single isolated organ or tissue during the course of an experiment.

The blood sugar method of insulin assay (originally devised by Marks) was designed to overcome the first type of variation. In this method the same animals were used for both standard and unknown insulin solutions; hence the individual differences tended to cancel out.

The second type of variation, that of the individual from day to day, was largely overcome by using a very large series of tests and averaging the results.

The actual technique of assay was briefly sketched. At the Commonwealth Serum Laboratories, insulin solutions were also standardized by a modification of Trevan's mouse convulsion method. The principles of this method depended on the fact that, if a large number of mice were divided into groups, if each group were injected with different doses of insulin (in ascending order), if the mice were kept at 37° C. during a period of two hours, and the percentage convulsions obtained in each group were plotted against the dose for that group, a characteristic S-shaped curve could be constructed. This curve was termed the "characteristic" for the effect of insulin on mice. It was, moreover, a fixed property and the slope of the curve did not change when different samples of insulin were used.

Such a reference curve being constructed, an assay was carried out by selecting a number of mice, half being injected with a suitable dose of standard and the remainder with a quantity of insulin under test, a dose being used which was assumed to be approximately equivalent to that of standard. By estimating the percentage convulsions on standard and unknown respectively, and referring to the characteristic, the relationship of standard and unknown could be readily calculated.

At the Commonwealth Serum Laboratories a minimum number of one thousand mice were used in a series of such assays, to determine the potency of each batch of insulin. In addition, a large series of blood sugar assays were performed, 200 to 300 rabbits being used, and upwards of 2,500 blood sugar estimations being made per batch.

In practice it had been found that the results obtained independently from mouse "convulsions" method had seldom differed appreciably from those obtained by the blood sugar method. Over a series of five recently standardized insulin batches the maximum difference had been 5%.

In the case of pituitary extract assay principles were, of course, essentially similar to those underlying insulin standardization, but the position was complicated by the fact that more than one active principle was involved. Comparative assays were made against international standard to estimate: (*a*) oxytocic activity and (*b*) pressor activity. In the case of (*a*) direct comparisons were made between effects of standard and unknown on the isolated uterus of the virgin guinea-pig prepared in the manner exhibited.

Pressor principle (*b*) was estimated by direct comparison of effects of doses of standard and unknown on the blood pressure of the anæsthetized dog (also exhibited).

It was the practice at the Commonwealth Serum Laboratories to issue pituitary extract in two strengths: (*a*) 10 international units per cubic centimetre (oxytocic value) for obstetrical purposes, and (*b*) 20 international units per cubic centimetre (pressor value) for surgical conditions.

Dr. Broben also showed several ovaries removed from rabbits which had been subjected to the modification of the Aschheim-Zondek test, described by Friedman and Lapham. He stated that the tests had been performed in connexion with experimental work on anterior pituitary extracts, and the results had been so striking that it was thought the demonstration might be of interest.

Diphtheria Anatoxin.

DR. C. W. ADEY discussed the preparation and use of the diphtheria prophylactic known as anatoxin. He described how diphtheria toxin was prepared and demonstrated the effect of minute quantities of it in experimental animals and upon a human being. He next showed that, by the addition of formaldehyde to toxin and by maintaining it at a suitable temperature, the mixture lost its toxic properties and retained, almost intact, the immunizing value of the original. Exhibits were shown which demonstrated the precautions which are taken at the laboratories to insure that the anatoxin is sterile and free from harmful effects.

It was pointed out that the Ramon flocculation test was used to estimate the immunizing value of anatoxin and supplemented the tests upon animals which showed these properties. Dr. Adey stated that this test yielded consistent and valuable results in estimating the quality of the anatoxin.

In answer to a question upon the duration of the immunity following immunization with anatoxin, Dr. Adey stated that, although only nine or ten years had elapsed since anatoxin was introduced, Ramon and his colleagues had already obtained considerable evidence on this subject. Their results showed that, of every one hundred children receiving a course of immunization, three or four would be found susceptible by the Schick test at the end of one year thereafter. Practically all of the remainder would prove immune and retain sufficient immunity until the artificially produced immunity was replaced by a naturally occurring immunity which seemed to develop in most persons as they approached maturity.

Vaccines and Immunity.

DR. F. T. WHEATLAND demonstrated the method employed at the laboratories for the preparation of stock bacterial vaccines.

He then discussed the subject of immunization against intestinal diseases by means of the administration of vaccines by the mouth, giving a short summary of the work of Besredka and of his theory of local immunity. Mention was made of the use of this method of vaccination against enteric infections in France and in South Africa, where it has been employed in a large scale in the mines.

Samples of "T.A.B." vaccine, in the form of tablets and of bile pills, were shown.

Dr. Wheatland also discussed the methods of testing patients for hypersensitiveness to pollens, and described the method of collecting pollen and the preparation of extracts of pollens. Specimens of various grasses and weeds whose pollens commonly cause hay fever, were shown.

Physical Apparatus.

In the biochemical laboratory DR. W. W. HURST exhibited certain pieces of physical apparatus employed in control methods. The electrical method of measuring hydrogen ion concentration, using both the hydrogen electrode and the quinhydrone electrode, was demonstrated. The electrical equipment was capable of detecting potential differences of one-hundredth of a millivolt.

The use of the Rayleigh interference refractometer for liquids in measuring very small differences in refractive index, and hence in concentration, was then explained.

A demonstration of the working of the spectrograph in recording absorption and line spectra was made. It was pointed out that this instrument was particularly of value in detecting the presence, even in minute quantities, of certain metallic impurities in raw materials and in finished products.

There were also exhibited a Christiansen ionometer, an instrument for the rapid and direct measurement of electrical conductivity, a Klett bio-colorimeter for colorimetric and nephelometric quantitative determinations and a polarimeter for measuring the optical rotation of liquids.

NOMINATIONS AND ELECTIONS.

THE undermentioned have been elected members of the New South Wales Branch of the British Medical Association:

Branch, Alexander Innes, M.B., 1931 (Univ. Sydney), Delegate.
Kershaw-Hynes, Marie Eleanor, M.B., B.S., 1928 (Univ. Sydney), 10, Wandella Avenue, Roseville.
Nelson, Selwyn Graham, M.B., B.S., 1930 (Univ. Sydney), Abbott Street, Gunnedah.
Wearn, Albert Arthur, M.B., B.S., 1930 (Univ. Sydney), Collarenebri.
Wilson, Joseph Besnard, M.B., B.S., 1929 (Univ. Sydney), 73, Belgrave Street, Manly.

University Intelligence.

THE UNIVERSITY OF SYDNEY.

A MEETING of the Senate of the University of Sydney was held on December 5, 1932.

The following diplomas were awarded:

Diploma in Psychiatry: Guy Ardlaw Lawrance, M.B., James Manning Rainbow, M.B., Ch.M., Stanley George Stevens, M.B., B.S., and Irene Beatrix Sebire, M.B., B.S.

The following appointments were approved: Mr. S. E. Williams, M.Sc., as Demonstrator in Physics; Dr. H. C. Donovan as Examiner in Clinical Obstetrics; Mr. N. W. West and Mr. E. Cole as Demonstrators in Pharmacy; Dr. E. Sydney Morris, M.D., as Examiner for the Diploma in Public Health; Dr. F. A. Maguire, M.D., and Dr. I. D. Miller as Examiners in Anatomy for the third degree examination in medicine; Mr. A. Burges, B.Sc., as Demonstrator in Botany; Dr. T. H. Small and Dr. Dixon Hughes as Tutors in Obstetrics for Lent Term, 1933.

Mr. R. M. Kirkpatrick, B.D.S., was appointed as Dental Research Scholar for 1933.

The Myrtle Sperrey Wardlaw Prize was awarded to Mr. G. S. Adam.

The following arrangements were approved for the delivery of Italian lectures at the University in 1933: Dr. A. Baccarini to conduct (i) a class for beginners, and (ii) a class that may lead to matriculation, as was in force during the current year.

Medical Prizes.

THE ALVARENGA PRIZE.

THE College of Physicians of Philadelphia announces that the next award of the Alvarenga Prize, being the income for one year of the bequest of the late Señor Alvarenga, and amounting to about three hundred dollars, will be made on July 14, 1933, provided that an essay deemed by the Committee of Award to be worthy of the prize shall have been offered.

An essay intended for competition may be upon any subject in medicine, but must be accompanied by a written assurance from the author that it has not appeared previously in print, either in whole or in part, in any form, and has not been presented elsewhere in competition for a prize. The essay should represent an addition to the knowledge and understanding of the subject based either upon original or literary research. It must be typewritten, and in English acceptable for publication without necessity for editing by the Committee. Any illustrations should be appropriate and correctly annotated with the text. Essays must be received by the Secretary of the College on or before May 1, 1933.

Each essay must be sent without signature, but must be plainly marked with a motto and be accompanied by a sealed envelope having on its outside the motto of the paper and within the name and address of the author.

It is a condition of competition that the successful essay or a copy of it shall remain in possession of the College; and that it may be published by the author with the consent of the College; other essays will be returned upon application within three months after the award.

No award of the Alvarenga Prize was made for 1931.

Correspondence.

A DISCLAIMER.

SIR: In reference to an article appearing in a weekly journal published in Sydney last week, I wish to disclaim any responsibility for the publication of any matter in which my name is mentioned.

Yours, etc.,

F. A. MAGUIRE.

193, Macquarie Street,
Sydney,
December 19, 1932.

Books Received.

A SYNOPSIS OF SURGICAL ANATOMY, by A. L. McGregor, M.Ch., F.R.C.S., with a foreword by Sir H. J. Stiles, K.B.E., F.R.C.S.; 1932. Bristol: John Wright and Sons, Limited. Crown 8vo., pp. 623, with illustrations. Price: 17s. 6d. net.

CONQUERING ARTHRITIS, by H. M. Margolis, M.D.; 1932. London: George Routledge and Sons, Limited; Australia: Angus and Robertson. Crown 8vo., pp. 202. Price: 12s. net.

THE PRINCIPLES AND PRACTICE OF OTOLOGY, by F. W. Watkyn-Thomas, F.R.C.S., B.Ch., and A. L. Yates, M.C., M.D., F.R.C.S.; 1932. London: H. K. Lewis and Company, Limited. Demy 8vo., pp. 580, with 199 illustrations. Price: 25s. net.

Medical Appointments.

Dr. M. J. Holmes (B.M.A.), Dr. F. McCallum (B.M.A.), and Dr. L. W. Nott (B.M.A.) have been appointed Medical Testing Officers for the purpose of the *Motor Traffic Ordinance* 1932 and the Regulations for the time being in force thereunder.

* * *

Dr. F. J. Ryan (B.M.A.) has been appointed Acting Deputy Superintendent of the Parkside Mental Hospital, South Australia.

* * *

Dr. F. J. Bennett (B.M.A.) has been appointed a Certifying Medical Practitioner at Hawthorn, Victoria, pursuant to the provisions of the *Workers' Compensation Act*, 1928.

* * *

Dr. D. Wilson has been appointed Medical Officer of Health by the Dowerin Road Board, Western Australia.

Medical Appointments Vacant, etc.

FOR announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser", pages xiii, xv.

ALFRED HOSPITAL, MELBOURNE, VICTORIA: Medical Superintendent, Officer-in-Charge of General Clinic.

BRISBANE MATER CHILDREN'S HOSPITAL, BRISBANE, QUEENSLAND: House Physician, House Surgeon.

HOMŒOPATHIC HOSPITAL, ST. KILDA, VICTORIA: Resident Medical Officers.

LAUNCESTON PUBLIC HOSPITAL, LAUNCESTON, TASMANIA: Resident Medical Officer (male).

THE PUBLIC SERVICE BOARD, SYDNEY, NEW SOUTH WALES: Oculist.

WESTERN SUBURBS HOSPITAL, SYDNEY, NEW SOUTH WALES: Resident Medical Officer.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 135, Macquarie Street, Sydney.	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company Limited. Phœnix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association, Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	Brisbane Associated Friendly Societies' Medical Institute. Mount Isa Mines. Toowoomba Associated Friendly Societies' Medical Institute. Chillagoe Hospital. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL are advised, in their own interests, to submit a copy of their agreement to the Council before signing.
SOUTH AUSTRALIAN: Secretary, 207, North Terrace, Adelaide.	All Lodge Appointments in South Australia. All Contract Practice Appointments in South Australia.
WESTERN AUSTRALIAN: Honorary Secretary, 65, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.
NEW ZEALAND (Wellington Division): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington, New Zealand.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

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